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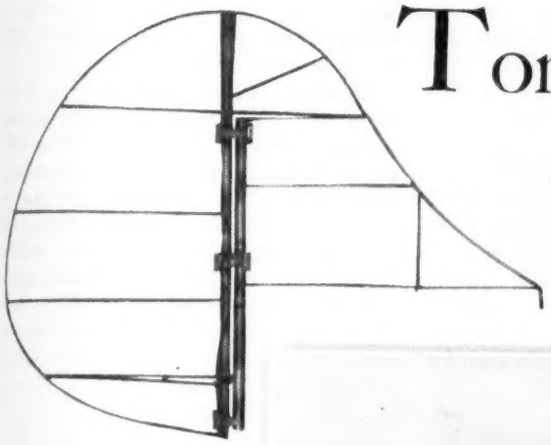
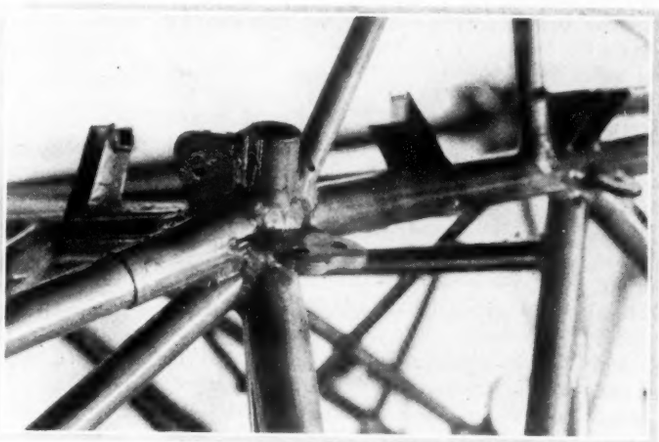
Aircraft Will Need 5000 Tons of Alloy Steel



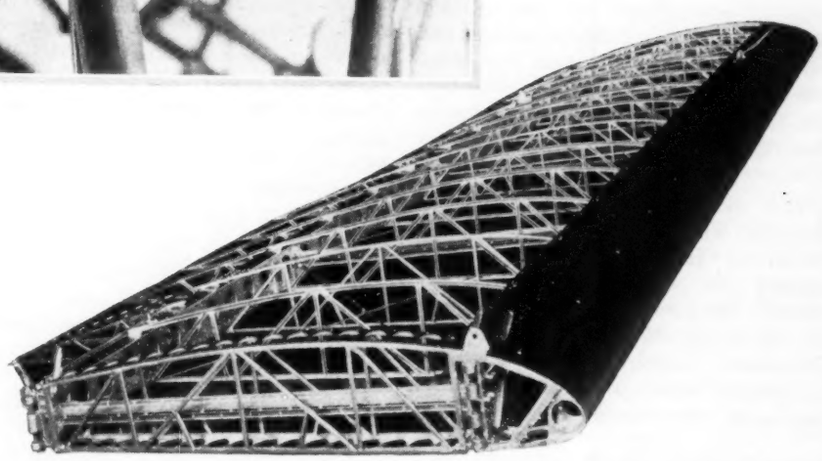
Requirements for 1929 Also Include Heavy Tonnages for Dies and Tools; Structurals for Hangars, Towers and Field Equipment

By H. J. French

Senior metallurgist, bureau of standards, Washington.



WELDED steel tube construction of vertical tail unit. At right, typical welded steel tube fuselage construction. Below, duralumin outer wing frame

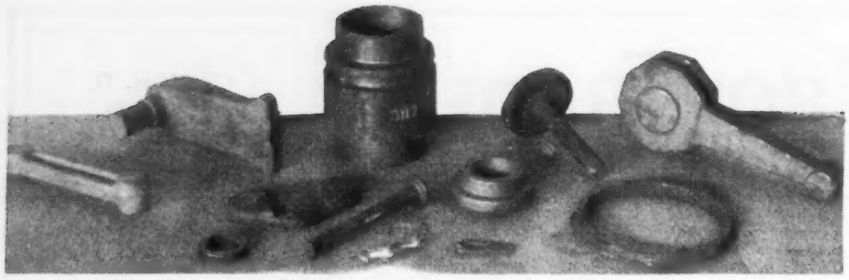


WITH the present rapid development of commercial aviation and the increasing use of metals in construction, it is, perhaps, timely to inquire what the aircraft industry may mean to the steel manufacturer with respect to both tonnage and character of steels required. Recent rapid growth of the aircraft industry may be illustrated by data given in a report of the aeronautics branch of the United States department of commerce:

"In aviation the industry is in the position of being far behind on orders. The production of aircraft during the calendar year, 1927, exceeded the 1926 output by more than 50 per cent. The civilian-owned planes in the United States now total over 4000. There are more than 900 firms now engaged in aeronautics. Of these, about 90 lay claim to manufacturing aircraft. The aeronautic engine manufacturers total more than a dozen.

"During the calendar year, 1927, the aircraft manufacturing proper produced 1828 planes valued at $14,131,225. These figures represent increases of 54 per cent and 59 per cent, respectively, as compared with 1926. Military service absorbed 616 of these in 1927 and 63 were exported, leaving 1149 available for civil consumption."

It is interesting to note that today, 25 years after what may be called the birth of the indus-



Steel forgings used in air-cooled aircraft engines

try, "the airways of the world show a greater mileage than did the railroads on their silver anniversary."

Nevertheless, tonnage requirements for steels used in actual flying equipment should remain a small part of the total production in the steel industry, even with astonishing increases in aircraft production. The reason for this is obvious since one object always in view is to keep down the dead weight of flying equipment. Further light is thrown on this subject by considering the demand of the automotive industry. Its products, which are built largely from steels, required only about 15 per cent of the total steel production in 1927.

Tonnage Demands Low

The business secured during the first seven months of 1928 from the aircraft industry has led one steel manufacturer to the conclusion that the demand during the calendar year, 1929, will be not less than 1500 tons of alloy steels for engine parts, 3000 tons of alloy steel for tubing, 100 tons of alloy steel for bearings and 50 tons of alloy steel sheet and strip. The total is not far from 5000 tons for the year with a market value in the neighborhood of one million dollars.

The development of commercial aviation will also require expansion in airway and airport equipment including the construction of airway towers, hangars and other buildings at airports. Such equipment will eventually require a considerable amount of ordinary structural shapes and also commercial sheets in various forms. Expansion of manufacturing facilities will require machine tool equipment and add to the demands for tool and die steels. It would therefore seem that the aircraft industry will need a variety of commercial and quality steels and there should be some measure of attractiveness to the business which will eventually come to the steel industry.

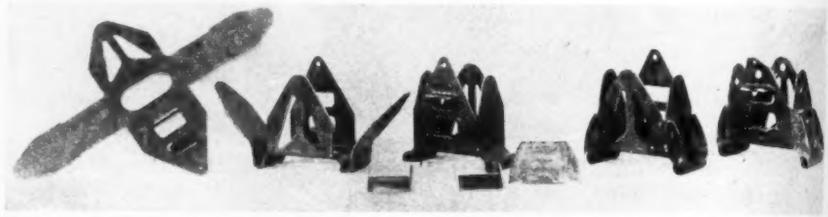
In discussing the general technical requirements for steels used in the aircraft industry a three-fold division may be made, as follows: (1) Steels which do not form part of the actual flying equipment, such as tool and die steels for manufacturing purposes and steels used in the construction of airway and airport equipment, such as beacon towers, hangars, etc.; (2) steels for aircraft power plants; and (3) steels used in the aircraft structure, such as fuselage, wings, etc.

The technical requirements for the steels in the first group are similar to the requirements in other industries. The characteristics of these steels are generally well known and no special comments are needed here.

The largest portion of the steels in groups 2 and 3 must meet special requirements, and it is to these that attention will be directed. Certain problems are common to both groups and will be considered first.

There are four general requirements for steels used in the construction of actual flying equipment. The steels should have (1) high strength per unit of weight to permit low dead weight of the aircraft; (2) high quality to insure reliability and satisfactory performance; (3) ease of fabrication; and (4) the ability, in individual cases, to meet special performance requirements.

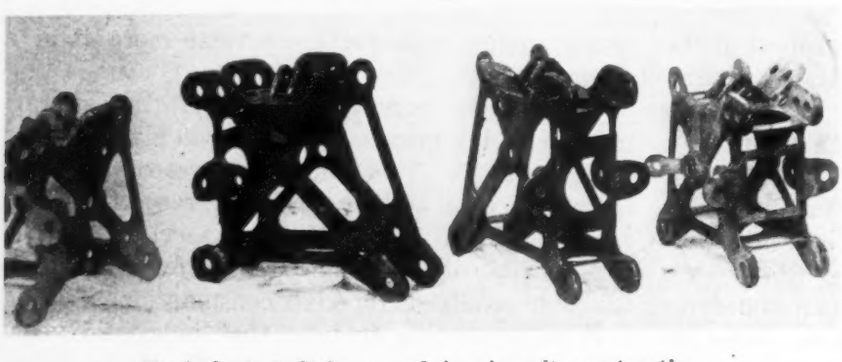
Another factor, maintenance, may come into play in selecting steels for certain parts of construction. For example, it may be possible to sacrifice some degree of resistance to corrosion if the character and location of the parts and the conditions under which the aircraft are used will permit easy and periodic inspection and adequate servicing to prevent corrosion.



Progressive stages of manufacture of a wing hinge fitting for flying boat

Hard drawn wire has the highest strength per unit of weight of any of the materials of construction. The strength-weight factors of heat-treated alloy steels, such as are used widely in the automotive industry, are about the same as those of some of the aluminum alloys, such as duralumin, and the present magnesium base alloys. However, the two latter groups have a higher bulk modulus. This means that for equal weight and strength the aluminum alloy parts will have a greater thickness and therefore have greater rigidity (stiffness) than the corresponding steel parts. Steels which might otherwise meet service requirements are therefore not as efficient as the aluminum and magnesium alloys for long columns and beams on account of their somewhat lower rigidity.

Aircraft steels are primarily quality steels, by which is meant that they must have a high order of purity, cleanliness and uniformity. High quality is of paramount importance since even occasional failures may cause serious losses of life and property. High quality tends to insure



Typical steel fittings used in aircraft construction

uniformity and, since low factors of safety are the rule in aircraft design, uniformity is necessary for reliability of performance. Inspection can make or mar the reputation of the products and plays an important role in the aircraft industry, since it is seldom possible to remedy the failure of important parts to function while in the air, as is the case with machines on land or water. Rigid inspection of vital parts of aircraft is not only desirable but quite generally practiced.

The subject of quality steels and what is a necessary degree of cleanliness and uniformity is one which is open to discussion. There is a small group, which believes that the steels now so widely used in the automotive industry are all that are necessary and that a dangerous situation is created, if what may be called super-quality materials are required to guarantee safe flying. A second and larger group feels that the standards of quality of aircraft materials cannot be too high and can point to numerous failures which have been eliminated, at least in part, by improved quality of the materials of construction.

Challenge Will Be Met

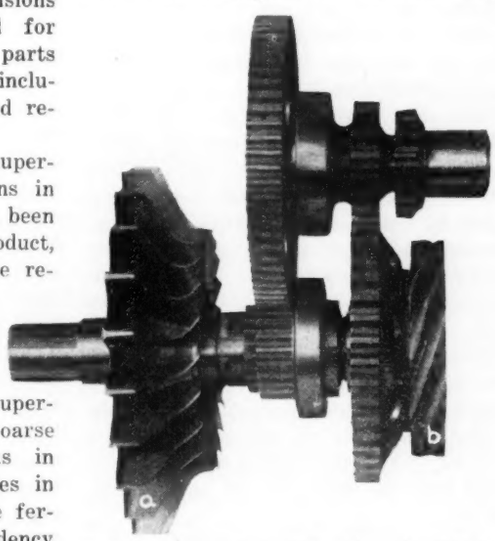
The aircraft industry is today calling on the steel industry to give it something a little better than the best. This challenge can and will undoubtedly be met by the steel industry and in the construction of flying equipment, as in any field of application, better, cleaner and more uniform steels are greatly to be desired.

An example may be given to illustrate the present trend. For some time, one steel manufacturer has examined microscopically for inclusions all alloy steel billets intended for high strength aircraft engine parts such as crankshafts. Trapped inclusions, almost minute, have caused rejection in the mill.

The commercial production of superclean steels requires modifications in mill practice and the trend has been toward the electric furnace product, since it is difficult to meet these requirements regularly with open-hearth steels. Cleanliness frequently has been obtained at the expense of other desirable properties. The superclean steels are generally coarse grained and introduce problems in heat treatment through difficulties in securing complete solution of the ferrite without increasing the tendency to crack in hardening. Impact values of the quenched and tempered steels also may be low and the forging ranges are narrow in comparison with the corresponding open-hearth products.

Articulated connecting rods of air-cooled motor

Many metal aircraft parts are intricate in design and up to the present time have been built up from tubing, sheet, wire and bar stock. Their construction, therefore, involves much hand work and necessitates one or more of the operations of cutting or other machining, hot or cold forming, punching and joining by riveting, welding, soldering or brazing. The steels used in the manufacture of such parts as fittings must, therefore, be readily workable in various ways, not only from the standpoint of reduced cost but also because it becomes increasingly difficult to insure reliability in service as the metals used in construction become more difficult to fabricate.



Drive gears for induction impeller. (A) is aluminum alloy impeller; (B) a bronze gear. Drive gears are of alloy steel

Simpler fabrication methods such as forging, extrusion, etc., will probably be applied more generally when there is quantity production over which to distribute the cost of dies. However, built-up structures have been and are at present very widely used and ease of fabrication is sometimes one of the principal factors governing the selection of materials.

Many of the steels used must meet detailed performance requirements, which vary widely in individual parts and include high strength, resistance to impact, fatigue, corrosion, high temperatures or wear. When combined with the general requirements already enumerated, aircraft steels frequently tax to the utmost the knowledge and ability of the steel maker.

Corrosion is one of the most important problems to be defeated, especially in equipment operating over or near salt water, and the use of protective coatings frequently enables the designer to use methods and products which would otherwise not serve satisfactorily.

Reduces Endurance Limit

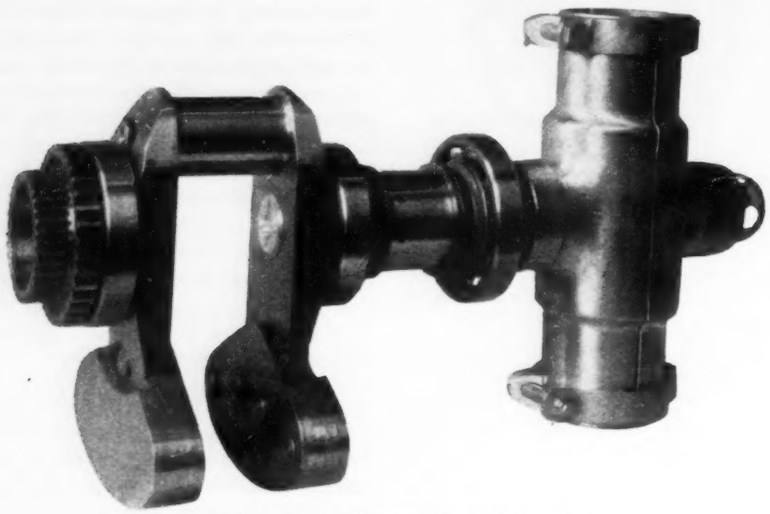
The effect of corrosion is especially notable when the corrosion is combined with repeated stress. Under corrosion in salt water, and to a slightly smaller degree in fresh water, the endurance limit is greatly reduced.

The character of the steels required for aircraft construction may be illustrated by considering present practice and typical applications. In discussing this subject briefly, it will be convenient to deal separately with the power plant and the aircraft construction. This division is logical, both from the standpoint of the industry, which at present is rather definitely divided into these two branches, and from the standpoint of the character of the service to be performed.

In the case of the aircraft power plant the problems of construction differ in degree, but not radically in nature, from those of the automotive power plant. Practice varies for different engines, but as a general rule little carbon steel is used, except in the cylinders and for parts of low strength which may require deep forming or welding in their manufacture. Parts requiring high strength, such as crankshafts, connecting rods, gears, shafts and many nuts and bolts, are quite generally

made from structural alloy steels similar to those so widely used in the automotive industry. These may be the nickel, nickel-chromium or chromium-vanadium steels and their strength and hardness in the condition used is sometimes limited, as in crankshafts, by the necessity of machining subsequent to heat treatment.

The cylinders or cylinder liners have most often been made of carbon steels. Carbon steels are not necessarily destined to hold sway in this field. One manufacturer is using nickel steel castings, another is using welded chromium-molybdenum steel, and there is a possibility that the nitrided special steels will find application in cylinder construction.



Crankshaft assembly of air-cooled motor

Steel containing various combinations of nickel, chromium and molybdenum with aluminum acquire a very hard surface when heated in ammonia at temperatures in the neighborhood of 930 degrees Fahr. and will not seize as readily as carbon steels when in contact with the metals ordinarily encountered in the construction of internal combustion engines.

Crankshafts and Connecting Rods

The nickel-chromium steels containing from about 1.25 to 2.0 per cent of nickel and 0.6 to 1.10 per cent of chromium have probably been the most popular of the alloy-structural steels used and in forging grades contain about 0.35 to 0.45 per cent carbon. However, there is not complete standardization with respect to the steels now used for crankshafts, connecting rods, gears and other engine parts requiring high strength. So long as the required mechanical properties can be secured by simple heat treatment, the chemical composition selected is of much less importance that the quality of the steel and the ease of forging and machining. The manner of forging is primary importance for highly stressed parts such as crankshafts and gears, and aside from forging defects the way in which the metal flows in the dies may make or mar the performance.

Most highly stressed parts are subjected to rigid inspection to guard the quality of the steel and its composition, and to insure satisfactory working and treatment. Requirements are generally severe, since reliability can be assured only by the best materials and workmanship.

The constant search for better materials of construction in the aircraft industry is illustrated by the recent application to wrist pins, pump shafts, gears, and ball and push rod ends of nitrided chromium-molybdenum-aluminum steels. A typical composition is 0.40 per cent carbon, 1.5 per cent chromium, 0.20 per cent molybdenum and 1.10 per cent aluminum.

Exhaust valves in airplane engines are an example of severe performance requirements. Operating conditions vary with the engine but temperatures up to 1600 degrees Fahr. are encountered. Hollow stems filled with oil, mercury or salt have been used to reduce the operating temperatures and this device, as well as other features of design, has been helpful in prolonging the life of valves. However, there is still need for improved valve steels which will better resist erosion from the hot exhaust gases, have a low rate of oxidation, maintain their hardness at exceedingly high temperatures and permit easy fabrication and the production of hard strong stems.

A promising development in valve steels is the nitriding of chromium-silicon-aluminum steel, containing about 8 per cent chromium, 2.5 per cent silicon, 1 per cent aluminum and 0.45 per cent carbon. Another steel now used in the exhaust valves of a well-known air-cooled engine is a chromium-nickel-silicon steel whose composition is based on stainless steel. This steel is of metallurgical interest since it does not react in the same way as ordinary steels to the usual processes of heat treatment.

Propeller Subject to Fatigue

The wooden propeller has now been replaced quite largely by the metal propeller, which does not tend to chip and split when operating in snow and sleet. However, metal propellers are subject to fatigue and failures from this cause are sometimes encountered after relatively short service.

Widely different forms of construction are employed in the industry today. Wood, duralumin and steel are each employed in the United States and the choice seems to be dependent largely upon the prejudices of the manufacturer and the type of aircraft under consideration. The proposition of steel used varies from little or nothing to over 30 per cent of the dead weight.

Fuselage and control surface construction is generally either of steel or duralumin, while the wing structure is most often made of wood or duralumin with steel fittings and wires. Steel is used for spars, especially in large units, but the wing ribs are usually of duralumin or wood. The landing gear and engine mounts are generally made of steel, but aluminum alloy construction is also found.

Steel construction is generally based on seamless steel tubing with welded joints. Duralumin construction requires riveted joints in formed sheets or tubes, as it is impracticable to secure satisfactory welded joints. Hence, there is an enormous amount of handwork in the usual duralumin construction. However, it has an advantage over the steel of lower weight and higher stiffness for equal strength, but it is more expensive under the present conditions of small production where die costs cannot be distributed over a large number of units. There is some question whether welded steel joints have the necessary degree of reliability, but recent improvements in electric welding practice will probably do much to eliminate such questions. Steel has the advantage over the aluminum alloys in bearing surfaces, where high strength and relatively high hardness are desired, and in the cost of fabrication.

Welded steel tube construction widely used in fuselage and control sur-

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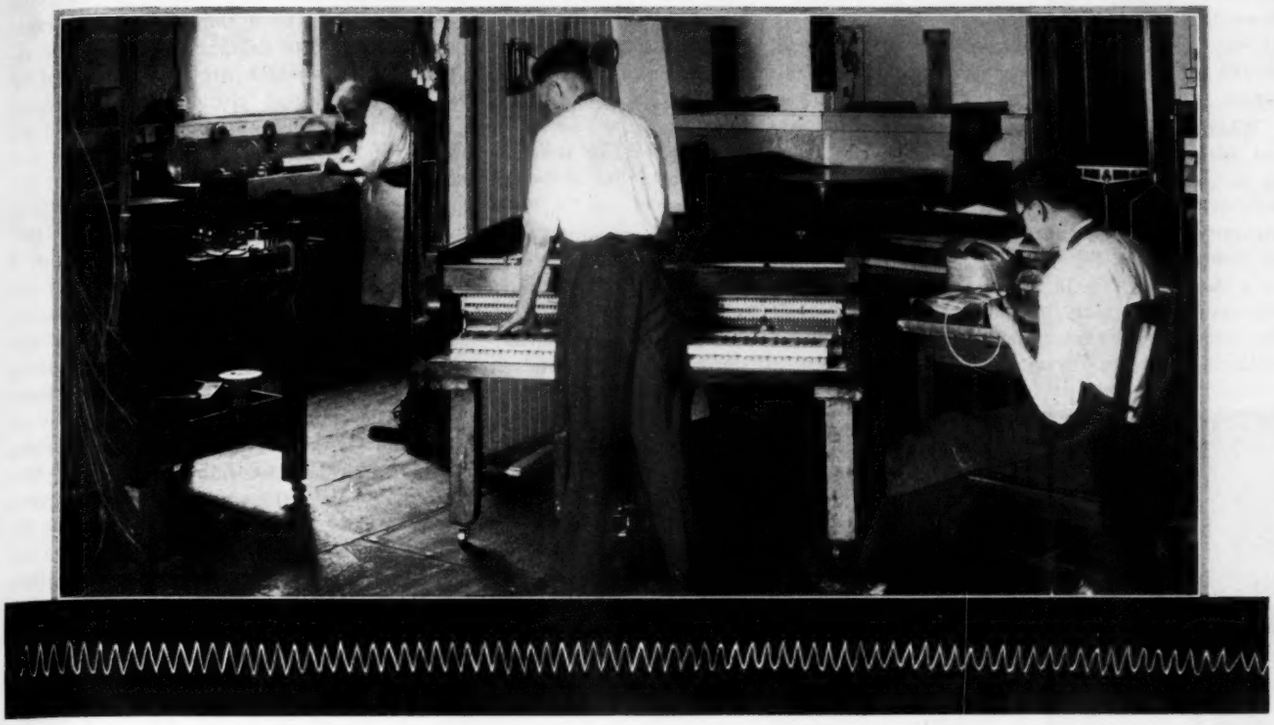


General view of acoustic laboratory, for testing steel piano wire. The lower illustration is a picture of a sound wave from a piano, in high treble, the wire vibrating 1396 *times per second*

Acoustic Laboratory An Aid in Making High-Grade Musical Wire

By William Braid White

PIANO wire output from the viewpoint of tonnage is comparatively small, yet when we take into consideration all the piano wire and all the spring wire which is in effect piano wire not up to piano requirements, and add to this all the wire used for musical strings in the smaller musical instruments, we have quite a respectable output. Furthermore, this is not the sort of product which can be turned out by the thousand tons in the certainty of the first and the last inch-length being exactly the same. Music wire is highly organized and highly temperamental; in fact, nearly as temperamental as are some of the musicians who coax beautiful sounds from it. Because of all this, the making of music wire is something which brings the steel mill and the wire drawer into a contact, far closer than most people would suppose possible, with the science of acoustics and the art of music.

The American Steel & Wire Co. has specialized in the manufacture of wires for the music industries, meaning by that steel wires for pianos, for mandolins, guitars and banjos, for the E strings of violins, and so on. The aggregate amount of the wire thus made may be called great or little, depending upon whether the output is measured by the ton or by the mile. A ton of piano wire of mean diameter will run to about 70 miles of length.

Closer Union Sought

So much has been realized for a long time, and means had been sought whereby closer liaison between makers and users of steel music wires might be perfected, but it was only during very recent years that such a contact became really practicable upon a sufficiently large scale.

It was felt that the only way of increasing the output of music wires was to do whatever could be done to assist the sale of musical instruments, and that this in turn meant, so far as we were concerned, rendering scientific help in the way of research into fundamentals and the development of new ideas which might be of use to the music industries of this country.

A large grand piano by Steinway & Sons is used in the laboratory as a standard of tone-production. The cross-sectional model is made exactly to scale in every detail from the same piano, and is as if a giant saw had cut through the latter, leaving a complete view of all the interior construction with the wooden pillars, the iron frame, the action and the other numerous details. A grand piano contains over 10,000 parts and when the steel wire strings are pulled up to pitch and the instrument is in tune, those wires are stretched with an aggregate strain of from 18 to 20 tons.

The next item is the Gaertner-White monochord, designed in the acoustic laboratory and built by the Gaertner Scientific Corp. This is really nothing more nor less than a one-string piano. Its purpose is to enable us in the laboratory to analyze the behavior of any piece of music wire under the conditions in which it is used in a musical instrument.

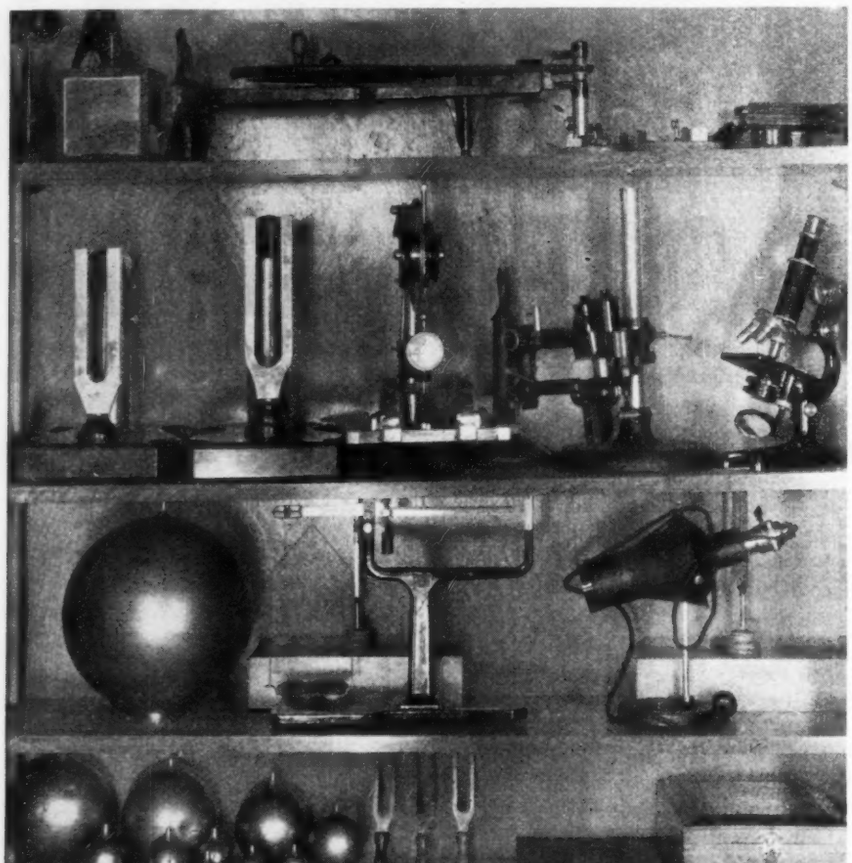
When piano wire is tested on the monochord, the required vibrating length is set off by means of the

The author is acoustic engineer, American Steel & Wire Co., Chicago.

movable bridge which may be clamped down in the middle of the instrument, at a length corresponding to the length of one of the strings of the piano.

When a manufacturer of a piano is not satisfied with some of the results he is getting in the way of tone, he asks the laboratory to analyze his instrument to see what might be done to improve it. The first thing to do in a case like this is to reproduce on the monochord, one by one, each of the strings of the submitted piano, following exactly its vibrating length and the diameter of wire used, then pulling each string up to the right pitch and noting how many pounds pull it takes to reach that pitch. In this way we get, first of all, complete information as to the total strain which the strings of the piano are imposing on the framework, and thus we can determine the very important question whether the iron frame is too light, too heavy or just right. Again, since the quality or color as well as the pitch of each sound depends upon the weight as well as the length of the string, and as the amount of the pull the string exerts when it is in tune depends upon its length and weight, each of these factors has to be isolated and studied by itself. There are 88 keys on a single piano, each having two or three strings, as the case may be, and about two dozen different diameters of wire are used, in lengths running from two inches to as much as seven feet in a concert grand. To analyze the string layout involves, therefore, extended research.

Our investigations require still more delicate apparatus. During the last few years there have been developed methods whereby a sound can be rendered visible and photographed. Such methods are in use in the laboratory.



Some of the equipment used in testing steel piano wire

We find it very useful to be able to photograph the sound wave which a stretched steel wire gives out and to preserve the record so obtained for later study and analysis.

For this purpose we use the Westinghouse osiso, as specially adapted for the acoustic laboratory by the makers. This instrument renders visible the music played upon the piano, thereby demonstrating one of our advanced methods for the analysis of music wires. The apparatus consists primarily of a microphone resting upon the grand piano, which is used to pick up sounds and transform them into electric currents, just as does the transmitter of the telephone or the ordinary microphone of the radio broadcasting station. The sounds thus picked up have their vibrations transformed into corresponding electric vibrations, which are then amplified by being passed through two vacuum tubes of radio type, and are then led into the small black camera-like box which forms the principal part of the osiso. In this box is a smaller box, made of steel, which carries two tiny wires set between the poles of a permanent magnet. These wires receive the vibrating current from the amplifier box. Being excited in this way, they twist and vibrate also under the influence of the permanent magnetic field in which they lie, and in exactly the same speed and pattern of vibration as the original sound has. A small mirror is cemented between the two wires so that when they vibrate it vibrates also. A beam of light is thrown on the mirror so that when the sound is emitted from the piano or from any other source, the vibrating wires give rise to a vibrating spot of light reflected from the little vibrating mirror. If a photographic film be revolved on a drum in front of this dancing spot of light, the shape of the motion will be caught on the film, and when developed will show itself as a long drawn out curve.

Curves Fundamentally Simple

Each of the curves is quite simple in form, in fact much like the curves which would be given out by a tuning fork. The sound which a tuning fork gives is the simplest sound known, and the curve is likewise simple. The high notes of a piano give curves very nearly like it.

The complication of the curve of a massive bass note simply means that the big, long, heavily-wrapped, copper-covered steel string vibrates in an extraordinarily complex way.

Two large Deagan standard tuning forks are used in the laboratory mainly to indicate time; in fact, as a sort of acoustic clock. The smaller one vibrates exactly 440 times per second when struck, and so, if we photograph its vibration, the resulting picture gives us an exact check on the number of the vibrations of any more complicated sound. We count the number of ups and downs of the tuning fork sound in, say, one inch of film, and check the other curve by that. The two forks are correct to within 1 vibration in 100 seconds and form, therefore, absolute standards of musical pitch. The smaller fork gives the standard A by which orchestras and pianos are tuned.

The round balls of assorted sizes

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Brisk Markets Inspirit Institute

Fall Meeting of Iron and Steel Producers Mirrors Recent Betterment—How to Hold Price Gains Now the Task—Record Attendance

SIX months of a bull market in steel flowered in the thirty-fourth general meeting of the American Iron and Steel institute at New York, Oct. 26. From the opening session in the morning, when President Charles M. Schwab delivered his keynote address to more than 2000 representatives of the industry, to the banquet in the evening, attended by the record number of approximately 1750, the proceedings were inspirited by the recent records in production and the stronger tendency of prices.

With the spring meeting last May there was a marked contrast. Then the theme was to build up prices, to put the iron and steel industry on a rightfully remunerative basis. This in some measure having been accomplished, the message to the industry last Friday was to consolidate and hold its gains.

There was further reference to open and legal means of sustaining prices, Mr. Schwab voiced the desirability of a temporary moratorium on new plant construction, the futility of cutting prices on a shrinking market was stressed.

Facing the market situation squarely, it was the consensus of opinion that buying of iron and steel has tapered off since the crest of the fourth quarter movement. This was generally accepted as a sequel to the already-heavy coverage for the quarter and the approach of some seasonal factors which militate against a continued record rate of operations. Some, however, blamed the lull to the presidential election and forecast that once this is passed tonnage will develop from quarters now unforeseen.

There was a unanimity of feeling that an unusually good last quarter is assured and the momentum will carry over into the first quarter.

Taylor Commends Division of Responsibility

DEPARTING from the precedent of the past two sessions, only Vice Presidents Willis L. King and James A. Farrell accompanied Mr. Schwab on the speakers' platform at the opening business session. Without deviation and with only a few general remarks at the conclusion, Mr. Schwab adhered to the text of his address, which is given on page 1114 of this issue.

Prior to the beginning of the morning technical session, Mr. King, Horace S. Wilkinson, chairman of the Crucible Steel Co. of America, and George M. Verity, president of the American Rolling Mill Co., discussed the business situation. Mr. King referred to the effectual disposal of the presidential year bogey. Mr. Wilkinson declared that the steel industry is launched on the most prosperous era since 1920.

According to Mr. Verity, there should be some open and legal manner in which production can be controlled to assure fair profits to steelmakers without proving inimical to consumers. Most users, he maintained, could pay $3 to $5 more per ton of steel without their business being affected. In quality and service the steel industry is now giving to consumers something for which they are not paying, and often low-priced steel is the most expensive to the consumer because it increases his manufacturing costs.

At the banquet in the evening, Myron C. Taylor, chairman of the finance committee of the United States Steel Corp., after lauding pioneers of the industry, said there could be no successor to Judge Gary. "The present system of corporate management, with duties divided, seems the safe, wise, cautious course to pursue," he declared. He said that J. P. Morgan Jr., Mr. Farrell and himself are in "happy harmony" in directing the corporation.

Aloyse Meyer, president of the Arbed Steel Corp. and chairman of the European steel entente, commented on the co-operation he had seen manifested between labor and management in an inspection trip of American steel plants. Ernst Poensgen, of the Vereingte Stahlwerk and the Stahlwerk Verband, said that the European steel industry, and the German branch in particular, welcomes the efforts of American producers to obtain more remunerative prices. Commodore Hugo Eckener, commander of the GRAF ZEPPELIN, and some members of his crew, were guests. Dr. Harry Emerson Fosdick, of New York, delivered an inspirational address, stating America's chief problem to be the handling of power.

A paper by William Braid White, acoustic engineer, American Steel & Wire Co., Chicago, on "An Acoustic Laboratory for the Testing of Music and Other Steel Wires," was followed by a discussion by Dr. Paul H. Bilhuber, of Steinway & Sons, and a brief piano recital by Ernest Schelling.

The paper, "Uniformity, Continuity and Magnetic Testing" by A. V. DeForest, research engineer, American Chain Co., Bridgeport, Conn., was discussed by Dr. Elmer A. Sperry, Sperry Gyroscope Co., Brooklyn, N. Y. Following the paper, "Steel Requirements of the Aircraft Industry," by H. J. French, senior metallurgist, bureau of standards, Washington, there was discussion by John F. Hardecker, navy yard, Philadelphia; E. C. Smith, Central Alloy Steel Corp., Massillon, O.; and Dr. Zay Jeffries, Aluminum Co. of America, Cleveland.

The paper of Dr. W. H. Hatfield, Brown-Firth research laboratory, Sheffield, Eng., entitled "Rust, Acid and Heat-Resisting Steels," was read by title. C. A. Meissner, of the United

(*Concluded on Page* 1115)

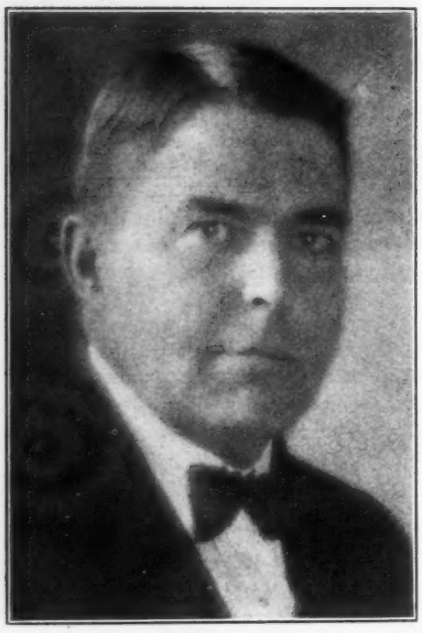
McCleary Made Director

ELMER T. McCLEARY, president of the Republic Iron and Steel Co., Youngstown, O., has been elected a director of the American Iron and Steel institute, class of 1929. *This insures his re-election. Two directorships remain vacant.*

Directors of the institute voted Friday to increase active membership from 1600 *to* 2000 *and associate membership from* 600 *to* 800.

The Gary medal for the most meritorious service to the iron and steel industry will probably be awarded at the May, 1929, *meeting, and the Institute medal for the best paper read before the institute in the preceding year probably will be given at the October,* 1929, *meeting.*

Long Experience Qualifies Institute Authors

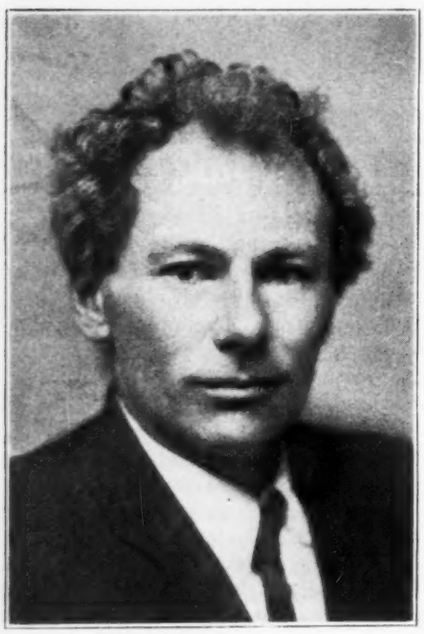


F. T. LLEWELLYN

FRED T. LLEWELLYN, president of the American Welding society, New York, and author of the paper "The Present Status of Structural Steel Welding," was born in Cardiff, Wales, in 1869, emigrating to the United States in 1890, settling in Minneapolis. That year dates his entrance into the steel industry, his first position being with the structural steel department of the Gillette-Herzog Mfg. Co., Minneapolis. Four years later he went to New Orleans as southern engineer, where he supervised the erection of the first steel skeleton tier building in that city and the first steel frame building in Louisiana. When the Gillette-Herzog company was absorbed by the American Bridge Co. in 1902, Mr. Llewellyn became contracting manager, first in St. Louis and later in New York. More experience was gained with the Carnegie Steel Co. and later with the Emergency Fleet corporation. Following the war he returned to the United States Steel Corp., where he now is an engineer in the office of the president. He has taken an active interest in welding in connection with steel building construction in recent years. Mr. Llewellyn is a member of the American Society for Testing Materials, American Society for Steel Treating, Brooklyn Engineers club, and the American Society of Civil Engineers.

W. H. HATFIELD

EXPERIENCED by many years with the Brown-Firth Research Laboratories, Sheffield, Eng., which since the armistice have specialized largely in rust and acid resisting steels, Dr. W. H. Hatfield, author of the paper, "Rust, Acid and Heat Resisting Steels," prepared it from first-hand information and research. He was the Campbell lecturer at the recent meeting of the American Society for Steel Treating in Philadelphia. Among Dr. Hatfield's associations in Great Britain are chairmanship of the steel ingots and corrosion committees of the council of the Iron and Steel institute; a member of the Institution of Mechanical Engineers, Automobile Engineers, Royal Aeronautical society, Sheffield Metallurgical association, of which he is a past president, and numerous technical committees. Dr. Hatfield is author of "Cast Iron in the Light of Recent Research," which has gained wide circulation in the United States as well as in Europe. He also presented 50 or more papers on the various phases of the development of iron and steel and kindred subjects before numerous European and American technical and scientific societies. As part of his work with the Research laboratories he has given attention to the problems involved in the construction of modern power generating plants. The Research laboratories contribute much to the scientific and technical progress of several of the largest European interests, including John Brown & Co., builder of about one-third of Great Britain's fleet, and Thomas Firth & Sons Ltd., during the war a great producer of shells.



A. V. DEFOREST

SPECIALIZING in the physical properties of steel, Alfred V. deForest, research engineer for the American Chain Co., Bridgeport, Conn., has made many valuable contributions to science. Author of the paper, "Uniformity, Continuity and Magnetic Testing," presented before the institute, he was recently awarded the Charles B. Dudley medal for work in his specialized field by the American Society for Testing Materials. Mr. deForest is a graduate of Massachusetts Institute of Technology, Cambridge, Mass., devoting most of his time there to the study of naval architecture. His first position was with the New London Ship & Engine Co., Groton, Conn. He became impressed with the importance of good materials, and particularly of high strength steel in the development of naval architecture, and decided to pursue further his studies in the field of metallography, attending Princeton university, Princeton, N. J. He assumed his present position with the American Chain Co. in 1918. Among contributions to science by Mr. deForest is his paper presented before the American Society for Testing Materials in 1923, in which he suggested a new method of magnetic inspection, constituting a non-destructive test of materials. Boating and affairs of the sea are the principal hobbies of Mr. deForest and all his spare time during the summer is given to this pastime.

Schedule Seven Speakers at Fall Session

W. B. WHITE

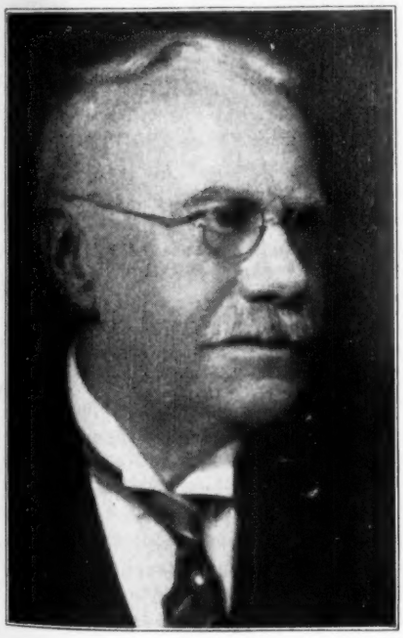
ASSOCIATED with the manufacture and testing of music wire for many years, William Braid White, acoustic engineer of the American Steel & Wire Co., Chicago, spoke with authority in presenting "An Acoustic Laboratory for the Testing of Music and Other Steel Wires" before the institute. Mr. White was born in Great Britain in 1878 and became interested in musical acoustics more than 25 years ago while acquiring a practical knowledge of musical instrument manufacturing in New York, where he had settled 28 years ago. As technical editor of *Music Trade Review*, he has contributed technical papers to that and other trade papers on practical acoustic research. He opened a laboratory in Chicago in 1921 for study and investigation of acoustic problems in musical instrument manufacture.

H. J. FRENCH

WITH the greater part of his industrial career spent in the study of aircraft engine manufacture, H. J. French, senior metallurgist of the bureau of standards, Washington, wrote with authority his paper entitled "Steel Requirements of the Aircraft Industry." He was born in New York and was graduated from the Columbia university school of mines with a degree in metallurgical engineering. Following practical experience in the West, he became associated with an eastern automobile and airplane engine plant as metallurgical engineer. During the World war he was engaged in metallurgical work for the bureau of aircraft production and in 1919 became associated with the bureau of standards. He is the author of numerous technical articles and is a member of Sigma Xi.

W. J. MACKENZIE

W. J. MACKENZIE, vice president in charge of metallurgical operations of the Interstate Iron & Steel Co., Chicago, and author of the institute paper entitled "Steels Used by the Automotive Industry," has devoted all his experience in the iron and steel industry to study and research in alloy steels. Mr. MacKenzie, a native of Canton, O., attended Case School of Applied Science, Cleveland, and was graduated from Harvard university, Cambridge, Mass., with the degree of bachelor of science. He has been with the Interstate company for 11 years and prior to that time was with the former Central Steel Co., Massillon, O., and the United Alloy Steel Corp., Canton, O.



C. A. MEISSNER

CARL A. MEISSNER, associate of assistant to president, United States Steel Corp., New York, metallurgical engineer and author of numerous technical articles, gave "Recent Observations of Some European Iron and Steel Conditions" to the institute. Mr. Meissner is a graduate in chemistry from the Columbia university, school of mines, New York. His industrial connections include the Joliet Steel Co., Joliet, Ill.; Brier Hill Iron & Coal Co., Youngstown, O.; Sterling Iron & Railroad Co., Sterlington, N. Y.; Vanderbilt Steel & Iron Co., Birmingham, Ala.; United States Steel Corp., New York; Londonderry Iron Co. Ltd., Londonderry, N. S.; Dominion Iron & Steel Co. Ltd., Sydney, B. C.; and Canada Iron Co. Ltd., Montreal, Que.

One Price and Ban on Construction Would Stabilize Steel

By Charles M. Schwab

IT IS always a great pleasure for me to meet with the members of this institute because these occasions afford an opportunity to further cement the wholesome relationships which exist among the membership.

This is a particularly auspicious time for us to meet to review the conditions bearing upon our own industry, because our country as a whole is still in the high tide of prosperity and prospects for the immediate future are unusually favorable. The unemployment which existed in some measure a few months ago has lessened. Workers generally are now fully employed and at good wages. The relations between labor and management were never more harmonious, due to the wise attitude of mutual co-operation and conciliation.

Business sentiment is good. This is particularly reassuring in view of the fact that we are to elect a new President of the United States within two weeks. It indicates that there exists little apprehension as to the results of the election and their probable effect on business.

Constructive Attitude Taken

One of the most encouraging signs toward continuing national prosperity is the new attitude on the part of the public toward so-called "big-business." The public and the government have come to take a constructive attitude toward the conduct of business. No longer do they encourage or expect ruinous competition; no longer do they fear large industrials.

Furthermore, there is common recognition in this country of the fact that industrial prosperity benefits not only investors in industrial securities, but also, to a far greater extent, industrial workers themselves, by increasing employment and by making possible the payment of liberal wages. Management of industry has also come to have a better appreciation of the inter-relation of good wages and industrial prosperity and therefore to recognize the stake which American business has in maintaining the purchasing power of American workers based upon our present wage scales.

From address of president, American Iron and Steel institute, at New York, Oct. 26.

The prosperity existing in our industries directly affects more homes today than ever before. While agriculture still remains our greatest industry the percentage of our total population now on the farms is smaller today than it has ever been before. The department of commerce estimates that less than 25 per cent of our working population is now engaged in agriculture as compared with nearly 50 per cent in 1880. The remaining 75 per cent of our working population depends for a livelihood upon other occupations, principally manufacturing, commerce and trade, and many of them are not only workers but stockholders as well. It is apparent, therefore, that upon the maintenance of our industrial prosperity depends the continuance of the present high standards of our living.

We all know that the iron and steel industry has not had its proper share of the going prosperity. When one considers the enormous investment in this industry, and the low rate of return which is being earned upon that investment, and then contrasts that rate of return with the earnings in numerous industries which are themselves dependent upon steel as a basic product, we will see how out of line is the reward being realized by this industry for its efforts. Let us ask ourselves frankly, "What are the fundamental causes of this condition?" and "Have our practices and policies been economically sound?"

I want to refer briefly to what I consider the two principal economic causes affecting the industry.

Pricing Methods Need Revision

The first such cause has to do with our method of merchandising. I refer particularly to the method of pricing. If you buy any article of merchandise in a department store you know that you are paying substantially the same price that any other purchaser on the same day will pay, and that it is useless for you to discuss the price with the clerk for it will not be changed. The department stores long ago learned the economic necessity of maintaining a single price.

The steel industry has never learned this, or, if it has learned it, has forgotten it, and instead of charging a single price open to all, we in the steel industry have been charging many prices, often quoting different customers different prices for the same products on the same day. Such a policy has resulted and will inevitably result in harming certain of our customers through price discrimination and in hurting ourselves by inviting our customers to haggle over prices, and tempting them even to misrepresent the prices charged by our competitors in the hope of coaxing lower prices from us.

No one will deny that the maintenance by each producer of any basic commodity of substantially uniform prices, at a proper level, is a desirable thing not only for the producers but also for the consumers. Fluctuating prices compel the consumers to

Farmers Also Must Be Prosperous

ALTHOUGH we have had several remarkably good business years in this country, fundamental conditions remain sound and I say with confidence that there has been established a foundation upon which there may be built a structure of prosperity far transcending anything we have yet enjoyed. Up to this time our prosperity has not yet been entirely uniform. There are some industries, such as the farming industry, which have scarcely felt it at all and some other industries, like our own industry, which have shared in it only meagerly. As I have often said we cannot hope to attain the maximum degree of prosperity for our country until we can have distributed prosperity shared in by virtually all classes and industries. That is why the great manufacturing industries of our country are or should be concerned in the economic problems of the farmers. For that reason I heartily commend the efforts that have been and are being made to work out the problem of the farmers. It is a subject that deserves the careful thought of every citizen.—CHARLES M. SCHWAB.

speculate on the cost of their raw materials. Such stabilization of prices is entirely possible of attainment without agreement or collusion on the part of the producers.

It requires merely a general recognition by the producers of two simple facts: *First*—The steel business is unlike many other industries in that, within certain limits, the demand for steel products is not appreciably affected by the general price level, and, therefore, a general reduction in prices for steel products alone does not result materially in increasing demand; and *Second*—It is not possible in a basic industry like ours to make effective for long at any one point two different prices for the same commodity. When one producer lowers his prices for a particular commodity, that price will promptly be met by his competitors. The net result in the long run is that each producer continues to produce substantially the same percentage of the total tonnage as before, but with a smaller profit margin, and sometimes none at all. I believe that a general recognition of these two facts would go far to remove the first economic cause of our failure to share in the general prosperity of this country, and that the adoption of the policy of open prices, open to all without preference or discrimination, would be of benefit alike to our industry and to our customers.

Great Gain In Capacity

The second fundamental cause of our economic difficulties to which I want to call your attention has been the relationship between the productive capacity and the consumption of steel in this country—and its consequences under the operation of the old law of supply and demand. The steel making capacity of this country has increased during the last 12 years from two sources: (1) New construction, especially new open-hearth furnaces constructed to meet the demands of the war; and (2) improvements in methods and practices since the war which have greatly increased the actual capacity of the blast furnaces and open-hearth furnaces already in existence.

Coincident with this increase in our capacity there has been a smoothing in the curve of demand which has largely eliminated the peaks and depressions in the demand for steel with which the industry was familiar before the war. Better railroad transportation facilities combined with the inceased mill capacity of the steel plants has made possible hand-to-mouth buying, so that production and consumption go on at substantially the same relative rates throughout the year with only minor seasonal variations. This is, of course, a healthy condition but it is new, and one to which the iron and steel industry has not yet entirely adjusted itself. Whereas formerly, demand exceeded capacity during certain periods, it does so no longer, and in more than five years there has not been a time of any substantial length when the capacity of the industry was unable to supply promptly the peak demand. The result has been that at no time in the last five years, until very recently, has the law of supply and demand operated to improve prices in our industry.

Along with the large increase in the steel capacity of this country, there has been and always will be a steady increase in the demand, reflecting growth not merely in population but also in wealth, with resulting requirements for new buildings, new bridges, additional transportation facilities and all of the various articles in which steel is used. This steady increase in demand always has been the salvation of our industry in the past periods of depression followed an over-development of capacity, and it is now and will be in the future the only permanent corrective of an over-expanded capacity. But in one respect there has occurred an important change—in the past the rate of increase in demand was very rapid, and demand doubled about every ten years, an average increase during each decade of 10 per cent a year. But no longer does it increase at the old rate. It has not doubled during the last 20 years, and in the 15 years since 1913, it has increased only about 55 per cent, an average increase of less than 4 per cent per year.

But, once a fair price basis is established, how long will it continue? As long, I say, as the proper relationship between supply and demand is maintained. The folly of indiscriminate price cutting though recognized by all is a phenomenon which accompanies low operating rates, and, although much can be said to emphasize its evil results, it would be idle to expect to eliminate it altogether in periods of slack demand merely by preaching economic truths. There are always individuals who are short-sighted enough to believe that they can, by price cutting, secure an advantage peculiar to themselves. There are, therefore, apparently three ways in which the stabilization of the iron and steel industry on a prosperous basis can be legitimately maintained. These are (1) by stimulating the demand for steel, (2) by discouraging by every lawful means the construction of additional capacity at times when the capacity is already over-expanded, and (3) by the avoidance of uneconomic price cutting.

The law of supply and demand is inexorable and if the producers of steel in this country do not voluntarily refrain from expanding capacity beyond the needs of the country, they can expect only one consequence. The law of supply and demand will promptly operate, reducing profits to the extent necessary effectively to discourage new construction, and that condition will continue until demand has again increased sufficiently to take up the excess capacity. I wish it were possible to have a temporary moratorium on the construction of steel capacity in this country. I firmly believe that with such cessation of new building, relationship between demand and supply can be established.

Sound Practices Needed

IF WE are to have distributed prosperity, benefiting alike all classes and all classes and all industries, it behooves each industry to consider whether its practices and policies and fundamental conditions are economically sound, and, if they are not, to put its own house in order. Prosperity in any industry cannot long continue in defiance of economic laws. It seems peculiarly fitting for the iron and steel industry, because of its size and importance, to make such a searching invesigation of itself, and, if its practices and policies and fundamental conditions are economically unsound, to consider what may properly be done to correct them.—CHARLES M. SCHWAB.

Brisk Markets Inspirit Steel Institute

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States Steel Corp., New York, "Recent Observations of Some European Iron and Steel Conditions." Charles Schenck, Bethlehem Steel Co., Bethlehem, Pa., and George H. Danforth, Jones & Laughlin Steel Corp., Pittsburgh, discussed the paper by F. T. Llewellyn, president of the American Welding society, New York, on "The Present Status of Structural Steel Welding."

"Steels Used by the Automotive Industry," by W. J. MacKenzie, Interstate Iron & Steel Co., Chicago, was discussed by Dr. John A. Mathews, Crucible Steel Co. of America, New York, and Henry Wysor, Bethlehem Steel Co., Bethlehem, Pa.

Metallography Simplified for Practical Use In Shop

By
E. Preuss
G. Berndt
M. v. Schwarz

Translated from the German by Richard Rimbach

Chap. VII—Critical Points and Equilibrium Diagrams

IRON as manufactured in industry, with the exception of electrolytic iron, almost never is the pure metal, but an alloy with a certain number of other elements, especially carbon, manganese, silicon, phosphorus and sulphur. These materials exist individually or in the form of compounds soluble in the molten iron and are partly thrown out of solution at lower temperatures.

Consequently, here is offered an analogy to the behavior of aqueous solutions of salts. A summary consideration of the phenomena occurring was not possible before the so-called equilibrium diagram was developed. Equilibrium diagrams can be determined by the heats developed during cooling and heating. The simplest explanation is given by the thermal analysis of a simple substance.

For example, if we cool molten lead from 350 degrees Cent. and observe its temperature at certain time intervals, for example, every 10 seconds, then we obtain the solidification curve *ABCD* as shown in Fig. 72. We find that the temperature does not decrease uniformly, but remains constant at 327 degrees during the time *BC*, during which the lead solidifies; from *C* it decreases again uniformly. The change from the liquid to the solid state is visible by a constancy of temperature; the solidification point is also called a critical point. Almost corresponding to it is the curve $D^1C^1B^1A^1$ of heating; the melting point is at the same temperature as the solidification point.

Several substances may exist in different modifications, as for example white and red phosphorus; or ordinary white tin and gray tin or tin disease which forms below 20 degrees Cent. These materials are chemically always the same, however, they differ widely in their physical properties. These transformations in the solid state are accompanied by corresponding changes of the heat content, which are detectable by a critical point on the cooling or heating curve. Generally, however, they are only very small and the temperature does not remain constant over a long period, so that the critical points are often noticeable only by a kink or a change in direction of the curve. If, for example, we observe the cooling of molten chemically pure iron, then we obtain the left hand curve shown in Fig. 73. The critical point *B* at 1528 degrees Cent. again corresponds to the solidification point; but also a second critical point *C* at 1528 degrees appears and a third one, less plainly defined, *D* at 768 degrees.

These critical points all show that the iron exists in the solid state in three different modifications which are designated as alpha (α), beta (β) and gamma (γ). The gamma modification of iron, stable above 1401 degrees Cent. is not considered here because it is hardly of interest in connection with the results of technical investigations. By X-ray analysis it has been found that alpha and beta iron have the same space lattice; this means that an independent beta modification does not exist. Nevertheless, we shall define by beta the nonmagnetic form of alpha iron as has been done before. The space lattice of the alpha (beta and also gamma) iron is of the 2 (or 9) point lattice where the atoms are not only in the corners, but also in the center of every unit cube. The gamma iron, however, crystallizes in the 4 (or 14) point lattice, where the atoms occupy both the corners and also the centers of the side planes of the unit cube. The X-ray examination can only be referred to briefly here; it furnishes both the

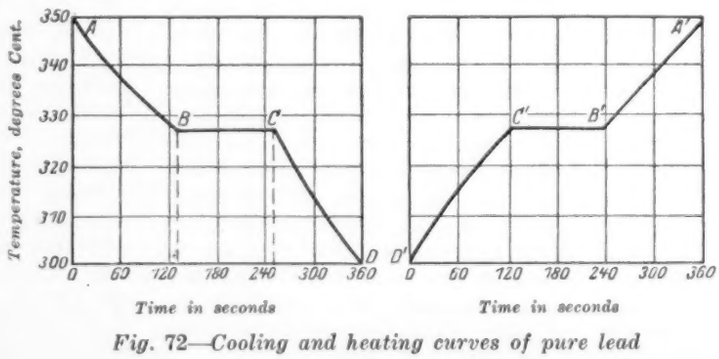

Fig. 72—Cooling and heating curves of pure lead

proof for the crystalline structure of metallic substances and also technically valuable information.

The alpha iron is stable up to 768 degrees Cent., crystallizes in cubes and is magnetic; the beta iron, however, which is stable from 768 to 898 degrees and has the same crystalline structure, is wholly nonmagnetic; the gamma iron also is nonmagnetic, stable from 898 degrees up to the melting point, differs from both alpha and beta by its octahedral crystals. The different critical points have been designated by their discoverer, Osmund, by the letter Ar_3 (898 degrees Cent.) and Ar_2 (768 degrees Cent.); the corresponding points on heating are called Ac_2 (change from the alpha to the beta iron at D') and Ac_3 (change of the beta into gamma iron at C'), Ac_2 lies at the same temperature, 768 degrees as Ar_2; Ac_3, however, is at 906 degrees. This is explained by the fact, that the transformation takes some time.

Occur in Carbonless Iron

The critical points Ac_1 and Ar_1 occur only in iron containing carbon. They correspond during the cooling to the formation of pearlite, during the heating to its solution; in both cases the temperature is found uniformly at 721 degrees Cent. During the solidification of an iron alloy containing 0.3 per cent carbon, the following transformation takes place:

Ar_3 = 840 degrees Cent.
Ar_2 = 768 degrees Cent. (magnetic transformation).
Ar_1 = 721 degrees Cent. (pearlite point).

However, if this alloy containing 0.3 per cent carbon is heated, then we find for Ac_1 and Ac_3 slightly different temperatures, which must be kept in mind when hardening the steel.

Ac_1 = 740 degrees Cent.
Ac_2 = unchanged at 768 degrees Cent.
Ac_3 = 845 degrees Cent.

Alloys with 0.58 to 0.90 per cent carbon show only the critical points A_3 and A_1 and at 0.9 per cent carbon content the points A_1, A_2 and A_3 coincide:

Ar_3, Ar_2 and Ar_1 = 721 degrees Cent.
Ac_1, Ac_2 and Ac_3 = 740 degrees Cent.

The equilibrium temperature of the pearlite is 721 degrees Cent. The gamma iron also differs from the alpha and beta iron insofar as even in solidification it does not precipitate out the carbon or, stated more exactly, the iron carbide (Fe_3C with 6.67 per cent carbon), which is formed immediately after the solution of carbon in the iron. It keeps the iron carbide in solution and forms with it the so-called "solid solution" or "mixed crystal." The gamma iron and the iron carbide dissolved by it cannot be separated from each other by mechanical or optical methods, just as it is the case of salt dissolved in water. Since the two constituents crystallize unseparated they are also called mixed crystals. The beta and the alpha iron, however, are not able to form solid solutions with the iron carbide and separate from it in transforming from the gamma modification.

For the explanation of the equilibrium diagram of the iron-carbon alloys we have to consider two cases of solutions: (1) Those in which both in the liquid and the solid state there exists a complete mixability; and (2) those, in which the liquid state both substances are completely soluble in each other, but separate again entirely during solidification (as is the case in the freezing out of aqueous-salt solutions). As an example of the first type we will consider copper-nickel alloys.

Single Critical Point

For such alloys with increasing copper content, we observe the critical points as they are shown in Fig. 74 left. In pure nickel we observe down to 900 degrees Cent., as would be expected, only one critical point marking its solidification a at 1451 degrees Cent. If now an alloy with 30 per cent copper is cooled down, then no marked solidification point can be observed; the solidification, however, takes place over the whole interval a_1b_1, in such a way, that at a_1 (1381 degrees Cent.) a solid solution begins to crystallize out, while the whole melt only becomes solid when the point b_1 (1310 degrees) is reached. Both limits are marked on the cooling curve by two critical points or kink points which are characterized by a pronounced change of direction. In an alloy with 70 per cent copper the solidification interval a_2b_2 (1235 to 1160 degrees Cent.) is shifted to lower temperatures, while the alloy with 100 per cent copper again shows no more than one critical point c—the melting point of copper at 1084 degrees Cent.

Continuous Curves Drawn

If we now construct a rectangular diagram with the percentage of copper as abscissae and the critical point of the various alloys as ordinates, then we can draw through them two continuous curves AA_1A_2B and AB_1B_2B, Fig. 74, right. These represent the equilibrium diagram of nickel copper alloys. Above the curve AA_1A_2B in Area I all alloys are liquid, below the curve AB_1B_2B in Area III, however, they are completely solidified, therefore the first curve is called the liquidous line, the second, the solidus line. In the Area II enclosed by both the solid and the liquid states coexist.

For an explanation of the process of cooling, we once more will consider the alloy with 30 per cent copper. The vertical line going through the abscissa point of 30 per cent cuts the equilibrium diagram in A_1 and B_1. On reaching the temperature corresponding to the point A_1 (1381 degrees Cent.), a separation of the crystals begins as explained above. We find their composition, if we advance on the horizontal line of constant temperature, going through the A_1 point, to the point C with the solidous line, since only a solid material with 13.5 per cent copper and 86.5 per cent nickel, corresponding to the point C, can coexist with the melt. Solid solution, lower in copper content, which was just precipitated, can exist only at a higher tem-

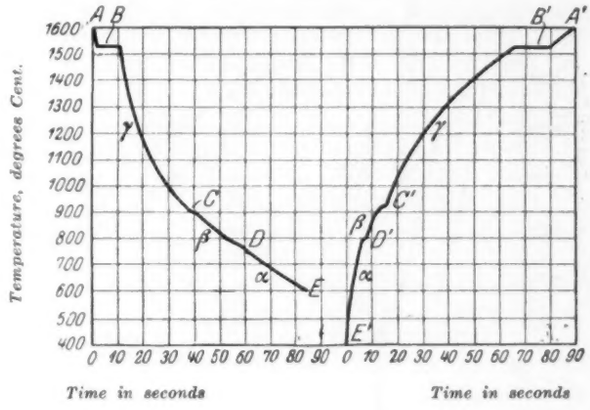

Fig. 73—Cooling and heating curves of pure iron

perature, as we can see from the course of the solidus line; solid solution richer in copper, however, only at a lower temperature.

This conclusion from the equilibrium diagram is also verified by the chemical analysis of crystals, taken from a melt, which just begins to solidify. If this mixture of melt and solid solution is cooled down, for example to D (1350 degrees Cent.), then we again obtain the composition of the both constituents, by drawing through D the horizontal until it cuts the equilibrium curves. We see that the solid solution has the composition E, 20 per cent copper, that means that it absorbed some copper from the melt. In further cooling their copper content increases still more along the solidus line *CEB* until the point B_1, 1310 degrees Cent. is reached, which again has the original concentration of 30 per cent copper. We see that in cooling in the region given by the equilibrium diagram first a solid solution of a lower copper content is precipitated. This copper content is again enriched, with decreasing temperature, to the copper content of the original melt, so that finally a melt, containing 30 per cent copper transforms into a solid solution of the same composition, which now remains unaffected.

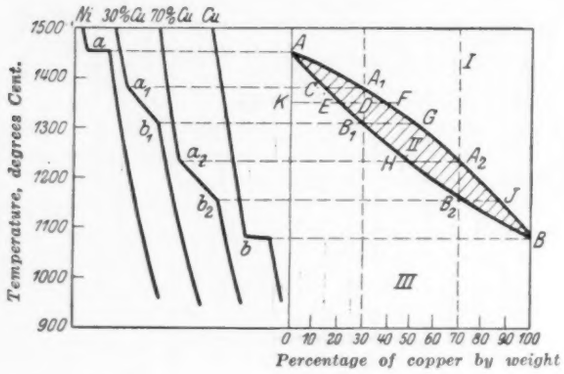

Fig. 74—Constitutional diagram of nickel-copper alloys

Homogeneous Solid Solutions

Here we presume such a slow cooling that by diffusion a homogenization of the solid solution in the solid state is obtained. In the case of a faster cooling, the core of the solid particles forming first is always richer in that compound (here it is nickel), which has the higher melting point. Such unhomogeneous solid solutions can be homogenized by longer heating to a temperature a little below the solidus line.

The equilibrium diagram not only permits the determination of the composition, but also the quantitative proportions of melt and solid solution, its amount we may call x, plus that in the melt, amount y must be equal to that of the original melt, we easily obtain for the 30 per cent alloy at the temperature D the relationship $x:DF = y:DE$. We see that the law of equilibrium on the lever is valid here, if we consider the distance EF as a lever with the center of rotation D and x and y as forces. In this case x/y = DF/DE = 5.8 millimeters/5.1 millimeters = 1.14. In heating naturally analogous phenomena take place; after reaching 1310 degrees (point B_1) a part of the solid solution melts; the first melt has the composition G or 55 per cent copper. With further increasing temperature the copper content of the melt decreases along the liquidus line *GFA* until at 1381 degrees, point A_1 a homogenous melt with 30 per cent copper is again present. The changes in every other alloy correspond.

Aircraft Industry Will Need 5000 Tons of Steel

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faces is less expensive than the riveted duralumin construction, but careful welding technique is required to avoid cracked joints and distortion of complicated structures, such as engine nacelles.

Only a few steels have been generally adopted for stressed members of aircraft. These comprise mild carbon steels in the form of sheets, bars and tubing, medium carbon steel for forgings and tubing, high carbon steels for springs and tension wires, chromium-molybdenum steel sheets, bars and tubing. The chromium-vanadium steel sheets formerly used have been replaced largely by chromium-molybdenum steel sheets.

Ordinary carbon steel castings have not yet found application in aircraft construction, but have been tried experimentally in landing gears. The 14 per cent manganese steel is used in the tail skid shoe, where a high degree of toughness, resistance to shock and wear are important.

Stainless steels have not yet been used extensively for aircraft construction but offer promising possibilities. For example, water tight pontoon construction is difficult to obtain with duralumin, which tends to corrode at welded joints unless heat treated subsequent to fabrication. As heat treatment is generally impracticable, riveted and caulked joints are now used. Satisfactory joints have been obtained in experiments with soldered stainless steels, and this practice is simpler and cheaper than that required with the present aluminum alloys.

A limited application of stainless steels is found in engine exhaust pipes and exhaust line valves.

New Chairman Appointed

Fred Erb, Erb-Joyce Foundry Co., Detroit, has been appointed chairman of the committee on molding sand research of the American Foundrymen's association to succeed B. D. Fuller who recently resigned from this post. Mr. Fuller, however, retains his interest in the committee's activities and remains on the executive committee of the association. The position of technical director has been created in the committee's organization and Dr. H. Ries, head of the department of geology of Cornell university and one of the foremost economic geologists in this country, has been selected to fill this position.

Program Is Arranged

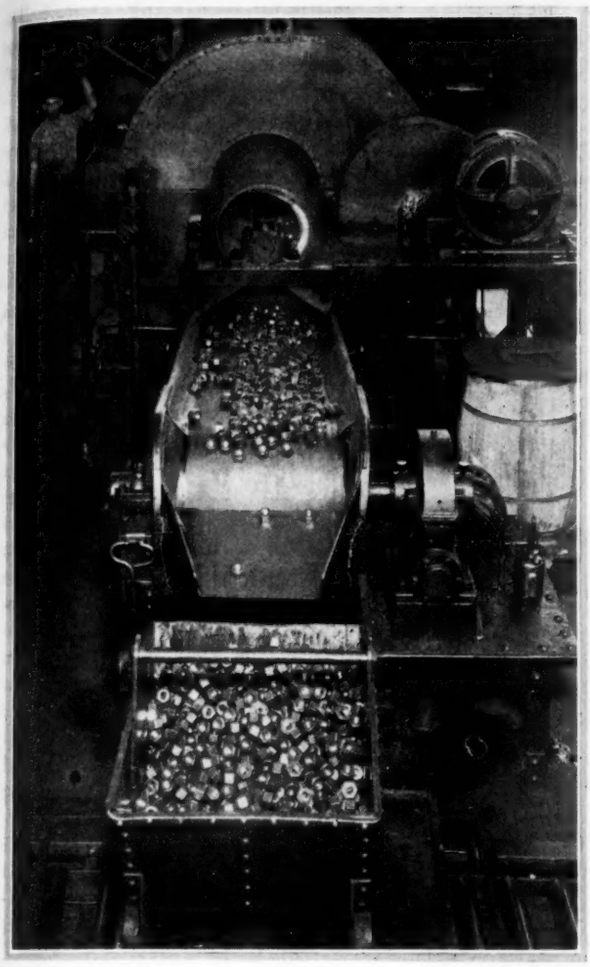
Program details have been announced for the fall meeting of the American Management association at the Palmer House, Chicago, Nov. 12-16. Eleven business sessions have been arranged at which a variety of papers relating to management, budgeting, profit-sharing and pensions will be read and discussed. On Wednesday evening, Nov. 14 members of the association are invited to attend a dinner meeting of the iron and steel division of the American Society of Mechanical Engineers. At this meeting several papers are to be read which deal with problems of the iron and steel industry.

The Carnegie Steel Co. has increased its fleet of coal and steel-carrying barges. A consignment of ten standand barges, each 175 x 26 x 11 feet, was received recently from the American Bridge Co., which increases the Carnegie fleet to 358 barges.

Modernizes Plant for Making Hot Pressed Nuts

Automatic Equipment at Finishing End Designed for Quantity Output

By George A. Richardson



DRUM type cleaning machine. The nuts are agitated in a hot chemical solution which removes the excess oil.

TWO standards for the manufacture of nuts are in common use in this country at present, namely:

1. *Shop or Manufacturers Standards.* Nuts conforming to this standard are placed on bolts regularly carried in stock and sold off the shelf. These sometimes are known as bin nuts, because the nuts are carried in stock in bins. When nuts alone are ordered the U. S. standard usually is furnished.

2. *U. S. Standard.* Nuts conforming to this standard are slightly larger in dimensions than shop standard nuts. Ultimately this and the previously mentioned standard will be abandoned in favor of a new one sponsored by the government and various societies.

In general all nuts ½-inch and smaller are made cold, while those ⅝-inch and larger, are made hot. The exception is ½-inch U. S. standard nuts, which may be made either hot or cold.

U. S. standard nuts are made in different styles and types as follow:

1. Hot pressed. Blank and tapped.
2. Cold punched. Chamfered and trimmed. Blank and tapped.
3. Cold punched. Semifinished.
4. Treated nuts. U. S. dimensions. Specially treated.
5. Standard unit lock nut. U. S. dimensions. Made in same types as previously mentioned.

In addition special nuts manufactured include the following:

1. Ideal recessed nut. This is distinctly a track bolt nut and usually is made to special dimensions. It is thicker and of special shape.

2. Tail nuts. Used chiefly on heelbolts on plowshares, etc. So-called because of a projecting tail which enables the farmer to turn them up tight by hitting with a stone or hammer.

Wrought iron and steel are used in making the finished products. The wrought iron is made direct from pig in the puddling department of the Lebanon plant. It is used for the manufacture of boiler staybolts, engine bolts, etc., and is handled separately from any other product of the Lebanon plant. Steel billets, coils, flats, rounds, and wire are shipped from other units of the Bethlehem company.

Commercial bolts, nuts, and related products are made from steel, the form of which depends to a large extent on the size of the finished product. Large bolts and nuts are made hot from bar stock, whereas the smaller sizes are made cold from coils of cold drawn sections or wire.

The hot nut shop is equipped with hand-fed and automatic machines, and has a capacity of 150,000 pounds of nuts per 10-hour day. Square or hexagon nuts ⅝-inch to 3½ inches can be made on the hand-fed machines. The size range of the automatic machines extends to 1⅜ inches square or hexagon, in either standard. Sizes larger than 3½ inches are made either on forging machines or from bars on the lathe.

Each hot nut machine is provided with powdered coal heating furnaces.

In making nuts flat bar stock is used, the length running from 8 to 9 feet in the case of a hand-fed or center feed type machine. To give some idea of the size of bars required for square and hexagon nuts two typical examples are cited:

1.—For bolts ⅜-inch diameter, the U. S. size of the nuts will be $\frac{11}{16}$-inch x ⅜-inch x $\frac{5}{16}$-inch thick, calling for a flat 21/32 x 25/64-inch. Normally, bin nuts would be supplied on bolts of this size, and in that case the dimensions would be somewhat smaller.

2.—For a 3½-inch diameter bolt, a

Describes Details of Nut Manufacture

SECOND of a series of articles describing mass production methods employed in the manufacture of bolts, nuts and related specialties at the Lebanon, Pa. division of the Bethlehem Steel Co. Modern facilities designed for the production of various sizes and types of bolts and the methods employed for their manufacture were described in the Oct. 25 issue. In this article the author discusses the details involved in the fabrication of hot pressed and cold punched nuts. Subsequent articles will describe the making of railroad specialties and kindred products.—THE EDITORS.

U. S. nut would be furnished, the dimensions being 5⅝ x 3½ x 3$^{3}/_{32}$ inches thick, for which a flat 5 x 3$^{1}/_{16}$ inches is the proper size.

Bars of the proper size are placed in the heating furnace and about 3 feet of one end brought to forging temperature. After this amount is worked up the bar is replaced in the furnace and another section heated. As a result of this practice it is customary to start charging at one side of the furnace and continue until there is a full charge, 40 to 45 bars, across the entire front.

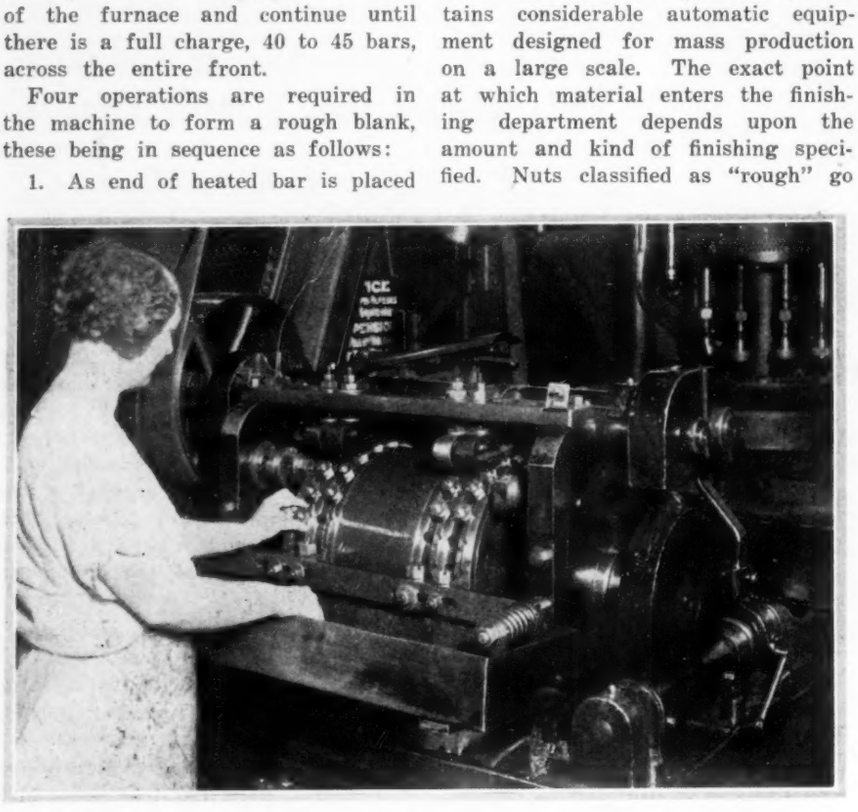
Four operations are required in the machine to form a rough blank, these being in sequence as follows:

1. As end of heated bar is placed in machine a piece of the proper length is cut off and shoved in the die. The die is stationary and fastened in the die-block. The moving parts are the punch, piercer and crowner.

2. The piece is pierced and crowned.

3. The crowner comes forward still further and ejects the nut.

4. A "picker" comes down, knocks the blank nut off the crowner, and on a flight conveyor, which carries it to a container holding about 3000 pounds. When full, the container is transferred by electric truck to temporary storage and weighed.



Nuts to be castellated are placed in the grooves of the drum and passed under milling cutters

Blanks Free of Burrs

The operations of the cold nut machines follow a sequence similar to that of the hot machines except that the blanks do not require burring or riddling. The stock entering the machine is cut off, formed with a forming punch and punched, after which the blanks go to the finishing dies. Tumbling, sorting and inspecting follow and the nuts then are ready for transfer to the finishing department.

All materials are assembled in individual containers in a room set apart for this purpose in the finishing department and loaded on buggies drawn by an electric locomotive on a narrow gage track.

The finishing department, where all the various finishing operations on bolts and nuts are performed, contains considerable automatic equipment designed for mass production on a large scale. The exact point at which material enters the finishing department depends upon the amount and kind of finishing specified. Nuts classified as "rough" go direct to the tapping department, tapping being the only operation before inspection and washing. Semifinished nuts are chamfered and trimmed and faced on the bottom. Finished nuts are made from cold-drawn steel on an automatic lathe.

The general order of work in the case of semifinished nuts is flatten, chamfer, trim, tap, face, castellate if required, wash and inspect. Both semifinished and finished nuts may be castellated.

In the majority of machines, the scrap in the shape of trimmings and punchings goes into the containers with the blanks and is separated later. A few of the machines, however, used for square nuts only from ¾ to ⅝-inch, separate the scrap at the machine and not only eliminate the necessity of riddling but finish the blanks in such a manner that burring is not required.

Storage battery trucks carry the containers in temporary storage to an electrically operated skip hoist, into which the contents are dumped, lifted, and poured on the screen of the riddler. This is a machine of the jig type, the screen being moved back and forth rapidly. The scrap drops through the screen into a small car and is ultimately remelted. The blank nuts slide down into another container and are ready for the next operation known as burring.

The burr, which is formed at the point of punching, must be removed by machine. Semiautomatic 2-spindle burring machines, which burr two nuts at one time, are used for this purpose. The blank nuts are set by hand in dies or jigs, mounted on a flat revolving turret. As this turret rotates it stops at points so located that two blanks come under the two spindles, each provided with three high-speed steel cutters. These descend and cut off the burr. At the same time the two nuts burred in the previous operation are brought over openings through which punches push them so that they drop into a container. The two operations of trimming off the burr and pushing the nuts out of the dies are performed simultaneously, while a fresh supply of nuts is being placed in the empty jigs; hence, there is little wasted time.

Scale Is Eliminated

Tumbling for the purpose of knocking off scale and sharp corners is the next operation. The nuts are carried to long motor-driven cylinders or tumblers in containers holding about 1400 pounds each. After tumbling, the nuts pass directly out at the far end to a sorting table where there is a thorough inspection and sorting. There has already been a partial inspection at the burring machines, where operators throw out any half-nuts. Each inspector spreads out the nuts, turns them over and eliminates those with cracks, unclean burring, poorly formed blanks, and any other imperfections.

The nuts again are dumped into containers and transferred to the loading station and thence to the finishing department.

A few automatic hot nut machines are in use, and for these 30-foot bars are furnished. The latter are transferred from the storage building on racks, the sides of which drop forming a table for the approach of the bars to the oil-fired furnaces. The bars are fed into the furnaces by hand and pushed out into the pinch rolls of the hot-nut machines.

With the exception of the automatic features, the operation of these machines is similar to that of the hand-

fed machines. There is one slight change in practice. In the case of the hand-fed machines the bars are rotated at each cutting-off position to offset the bending action at the die. This rotation is not necessary in the automatic machines, because their greater bearing surface offsets the bending action.

A few production figures help to visualize the amount of work that can be done. One hundred 1-inch hexagon nuts weigh 56.14 pounds. About 6000 pounds of these can be made in a day's run on a hand-fed machine and the capacity is increased to about 8000 pounds in the case of square nuts. The scrap loss is necessarily large, as it includes the punchings as well as the portions trimmed off. For hexagon nuts the average amount of material scrapped is 50 per cent. This is lowered to about 32 per cent in the case of square nuts.

The number of operations involved in producing blanks in the cold nut department is reduced considerably by reason of the fact that when they leave the machine they are ready for transfer direct to the finishing department without riddling, burring, etc. The stock comes in coils in usual weights of 200, 250 or 275 pounds each. Bin nuts are made on these machines at the rate of 60 to 80 nuts a minute per machine, according to the size.

Uniform Thickness Necessary

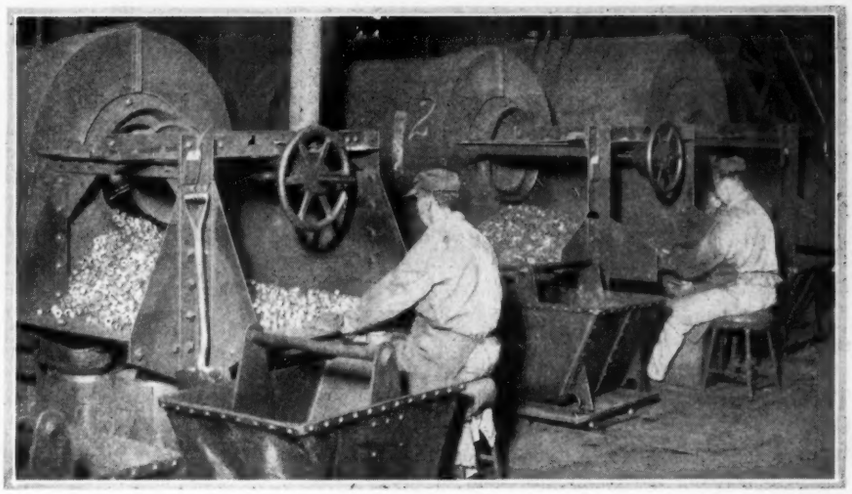
Although flattening is a commonly used term, pressing really better describes this first operation, which is for the purpose of obtaining a more uniform thickness and making the nuts more level. It is a preliminary operation for chamfering and is done in semiautomatic, hand-fed presses. Chamfering is the operation of beveling the corners of the nuts. Equipment of the general description previously mentioned is used, modifications being made according to the nature of the work involved.

The number of trimming operations depends on:

1. The size of the nut; 1⅜ to 1¾-inch nuts are trimmed five times; ½ to ⅞-inch nuts are trimmed three times.

2. The quality of the stock. A larger tolerance is allowed for irregularities.

A thorough inspection is made here for both surface and general imperfections. This is only one of numerous inspections. There is an inspection at each individual operation. Through the semifinished state this usually is done by the diesetter, but later inspections are made by persons whose duty is solely inspection.

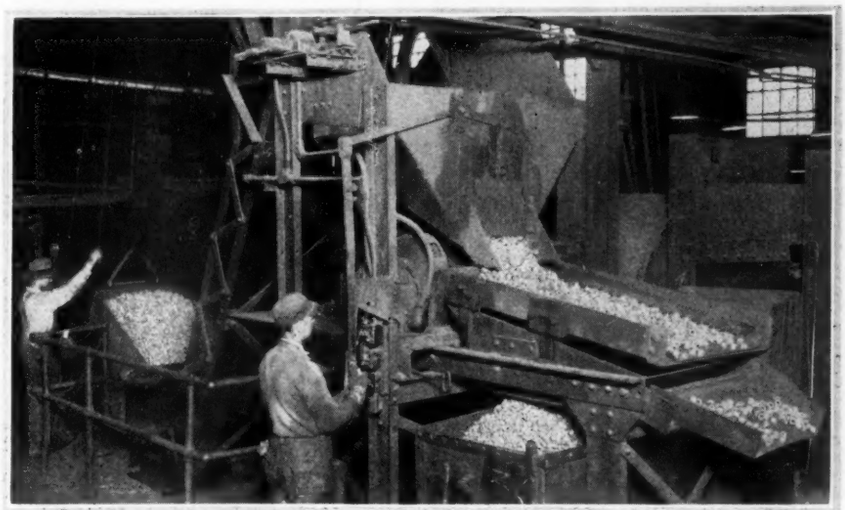


Tumbling machines for removing scale and sharp corners from nuts. Sorting and inspection tables serve each unit

One of the most interesting parts of the nut section of the finishing department is the division where tapping is done. Nuts ⅞-inch and smaller are tapped on automatic machines and larger sizes on hand-fed or semiautomatic machines. The semiautomatic tapping machines, depending upon the individual design, are fed by hand, either directly to the tap, or into a slot leading to the tap. The taps automatically are raised and lowered and as they come down tap the nuts which have been pushed into position. These nuts remain on the taps until the taps are filled. The taps which fill in rotation are lifted out, one at a time, while the machine is operating and the nuts are stripped off by hand. The taps then are reset in the machines. One group of automatic machines containing 39 units is used for the smaller nuts. These machines are capable of tapping from 1,000,000 to 1,500,000 nuts a day.

The nuts to be tapped are delivered in containers holding from 1000 to 2000 pounds each. These are dumped by crane into stock bins at the top of the machine. The nuts feed down from these bins by gravity into an open hopper. A circular disk, in the periphery of which are small lugs, rotates in the hopper. The lugs lift or pick up the nuts and push them into a narrow chute or track, down which they slide, one at a time, to a pusher or finger which, moving in and out, pushes the nuts on to the tap.

The tap is bent. It is mounted in a revolving head and rotates with the head. The nuts, either square or hexagon, instead of being removed after tapping from the tap end, pass off over the shank end and drop down into the inspection pan. Inspectors walking back and forth continuously keep a close watch for imperfect tapping. Small pans are used so that if a defect develops only a few nuts instead of several thousand



Jig type riddling machine for removing any scrap. The nuts are fed into the hopper by an electrically driven hoist

need to be sorted. With machines of this character nineteen ¼-inch nuts and twenty-one ⅝-inch nuts are tapped a minute. The higher tapping speed of the larger nut is due to its coarser thread.

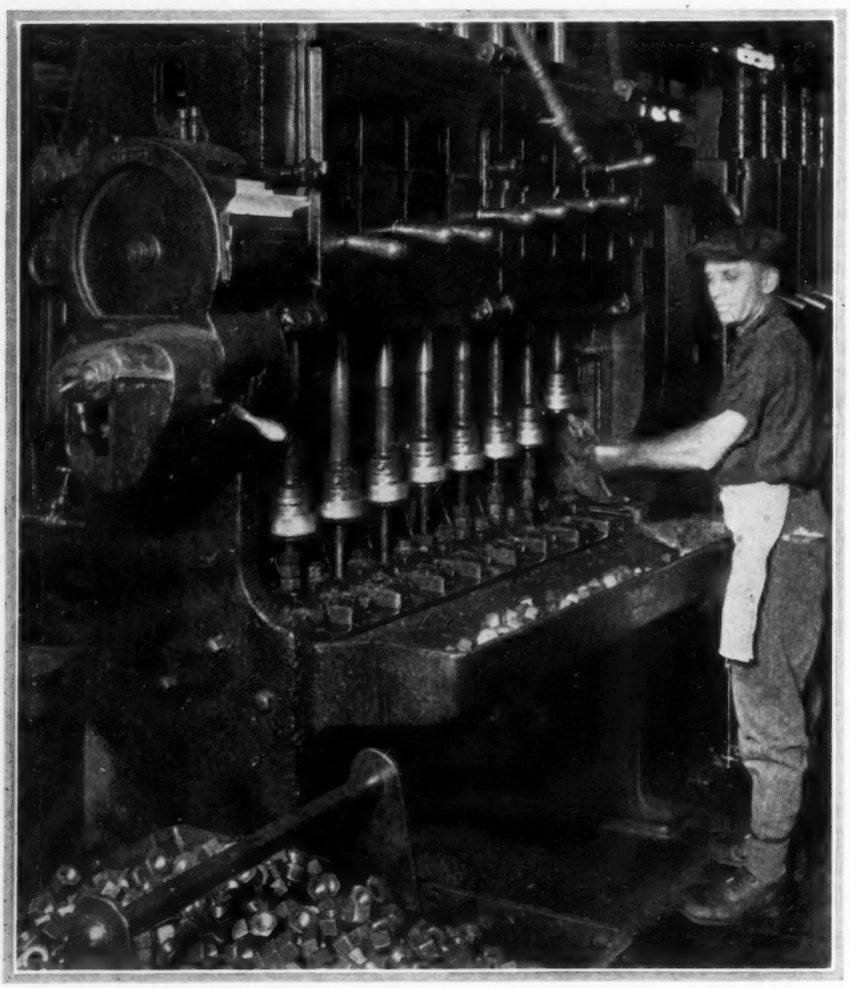
In some cases nuts, after tapping, go direct to nearby sorting benches where they are inspected and sorted. Other operations, however, may first be performed.

Facing, when required, is done on special machines. In this operation the cutter puts on a washer effect. The older practice of facing was to simply chuck nuts and run the cutter over them with the result that a good bearing surface was seldom obtained. Facing practice with new machines, which are hand-fed, is to run the nuts on to a threaded mandrel, thus obtaining an accurate face which sets level. Nuts from ¾-inch to 2 inches can be handled on these machines and the facing made to an accuracy of 0.002-inch.

Nuts are castellated to meet A. S. M. E. specifications. The new machines are built with a rotating drum. The latter contains four grooves in which jigs or chucks of the size and shape necessary are mounted. The nuts are placed in these. As the drum rotates the nuts pass under milling cutters located at the top of the machine, which cut one slot at a time. As the drum continues to rotate the nuts drop out and are set in position again for the cutting of the second groove. Nuts from ¼-inch up to 2 inches are handled on this equipment.

All nuts, with the exception of track bolt nuts, are washed, or in other words, cleaned in a hot chemical solution which cuts the oil. A slight film of oil remains which protects the nuts against rust. Nuts to be washed are dumped into the hopper of the washing machine and from there drop into a drum which holds the cleaning machine. This is equipped with steam pipes for keeping it at the proper temperature. The nuts are agitated in the solution and pass to a rotating screen which allows the surplus liquid to drain off. A short belt conveyor, on which they dry by their own heat, carries them to a container.

After washing, all cold-punched nuts are sorted, receiving a 100 per cent inspection. The nuts travel on belts passing before a number of inspectors. After inspection the nuts go in containers to the warehouse. Special nuts go direct to packing and shipping floors. Big nuts, particularly special ones, are finished in the machine shop.



Semiautomatic machine for tapping nuts ⅞-inch and larger. The taps are raised and lowered automatically

Laboratory Aids Music Wire Industry

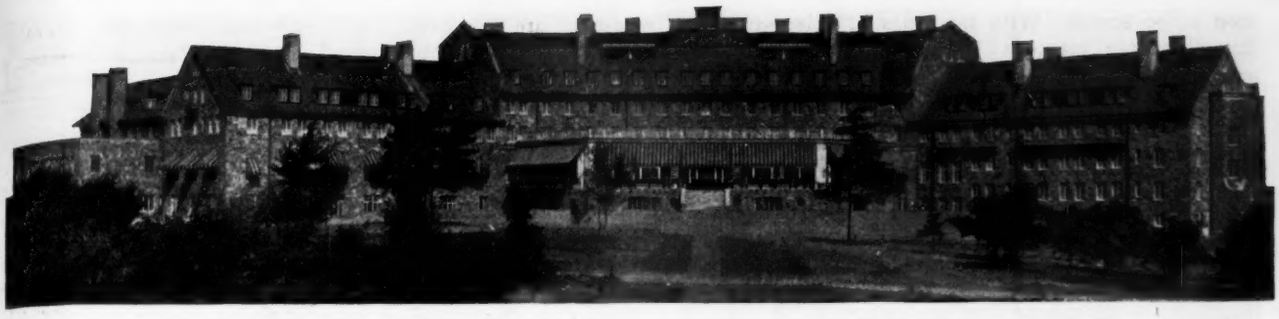
(*Concluded from Page* 1110)

are resonators. By placing one of them to the ear the sound to which it is tuned is reinforced so that, if we suspect that such a sound exists as a component of a compound sound, we can sometimes isolate it.

It may now justly be asked: to what is all this leading? In the first place, it is a characteristic of industry today that it anticipates rather than follows. When a great industry, which is an outlet for certain special products of a manufacturer of basic material, is in a position where it needs technical assistance, but at the same time is not organized to provide this from within its own resources, it is wise to proffer that assistance.

We believe that we have in this laboratory started something new and valuable. The great constituent factors of the steel industry are not in the public mind usually associated with anything so ethereal as sound waves. Yet, if what I have told you has meant anything at all, then surely there is no field more favorable for the operation of the policy of constructive anticipatory research than is furnished by the music industries, the greatest and most important part of which depends absolutely upon steel wire for the heart of its products.

There is a last point to be considered, which indeed contains the conclusion I wish to draw. The accomplishments of research departments in the automotive, the electrical, and the chemical industries have habituated the public mind to the thought of applying scientific methods to large-scale business. Research really means nothing more than fact-finding; and scientific wonders, so-called, are merely the result of applying accuracy and patience, backed up by suitable apparatus, to the task of finding facts. Today we live in an age of substitutes and adulterants as well as of new discoveries and new applications of old ones. No industry, however well founded it may think itself to be, can afford to neglect the possibility of some future, perhaps already imminent, form of competition arising from new discoveries in synthetic chemistry or in applied physics.



Skytop Lodge where annual convention of Machine Tool Builders was held

Record Attendance at Convention of Machine Tool Builders

MEMBERS and guests to the number of 225 met last week at Skytop Lodge, Cresco, Pa., for the twenty-seventh annual convention of the National Machine Tool Builders' association. It was by far the largest attendance in the history of the organization. This fact, coupled with the general feeling of elation over the gratifying condition of the industry, produced in the meeting a buoyant atmosphere of optimism which seemed highly appropriate in the elevated scene of the convention on top of the Pocono mountains.

Of the four prepared addresses on the program, three dealt exhaustively with the subject of co-operation through trade associations. The fourth was a treatise on important principles of cost accounting in the machine tool industry. The reports of officers and committee chairmen showed the association to be progressing steadily in its many activities. The group meetings, in which manufacturers of the major classes of machine tools met to discuss common problems of standardization, dealers relations, specifications, etc., were well attended. Many of the members participated in the annual golf tournament.

Four new officers and three new directors, whose names appear elsewhere in this report, were elected unanimously by the members of the association.

Cite Benefits of Group Action in Business

IN OPENING the first session Wednesday afternoon, P. E. Bliss, president, Warner & Swasey Co., Cleveland, and president of the association, spoke briefly of some of the activities of the organization. He then introduced H. I. Shepherd, vice president, Guardian Trust Co., Cleveland, who discussed "Mutual Aid in Business."

Mr. Shepherd traced briefly the development of group action in American industry. "Two things have happened," he said, "that are lifting business out of a certain haphazardness and making possible a sounder and safer development. One is increased knowledge and use of financial statements in the tying of operation into executive administration and the other is formation of trade associations."

"The consolidation of many manufacturing units into one general organization and the application of sound administration to all of these allied units through the use of concise and budgeted information has reached a high degree of development. This fact in itself places the smaller operator at a disadvantage in many instances and makes necessary the association of such units into a national or territorial organization, which can supply for its members something of the same expert analysis and advice that the larger organizations have within themselves."

Touching on administration of business, Mr. Shepherd predicted we are coming into what may be termed a period of glorification of the properly analyzed financial statement, showing the history of business operation recorded in the usual control figures. "The ability to budget or to forecast operation in business begets confidence," declared the speaker. "It begets confidence on the part of the management of the business itself and on the part of the banker who is called upon to extend a credit which must rely for its security and its ultimate liquidation upon performance in business."

In his address on "Some Problems in the Marketing of Machine Tools," H. B. Kraut, vice president, Giddings & Lewis Machine Tool Co., Fond du Lac., Wis., presented a detailed account of the organization and activities of the Verein Deutscher Maschinenbau-Anstalten (German machinery Manufacturers' association). This powerful body, usually referred

(*Concluded on Page* 1126)

New Officers

NATIONAL MACHINE TOOL BUILDERS ASSOCIATION

President

HENRY BUKER,
Vice president, Brown & Sharpe Mfg. Co., Providence, R. I.

First Vice President

H. E. D. GRAY,
Secretary and treasurer, Landis Tool Co., Waynesboro, Pa.

Second Vice President

CHARLES C. SWIFT,
Manager, Ohio Machine Tool Co., Kenton, O.

Treasurer

AUGUST H. TUECHTER,
President, Cincinnati Bickford Tool Co., Cincinnati

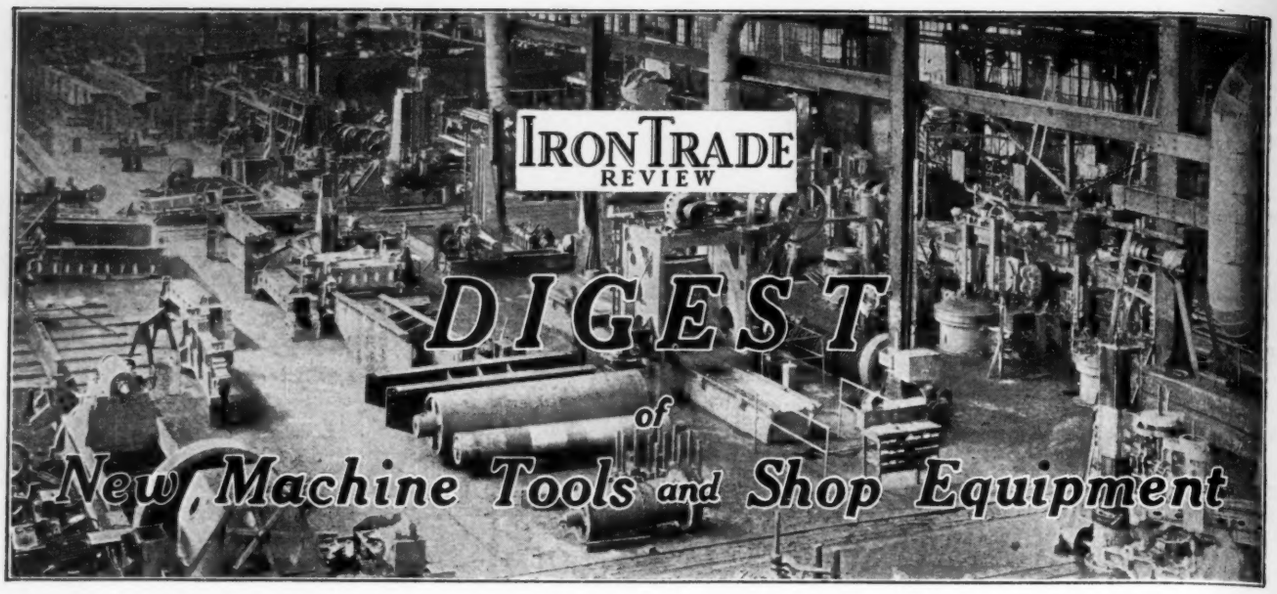
Directors

(3-year terms)

E. J. FULLAM,
Secretary-treasurer, Fellows Gear Shaper Co., Springfield, Vt.

C. A. JOHNSON,
President, Gisholt Machine Co., Madison, Wis.

F. V. GEIER,
Vice president and secretary, Cincinnati Milling Machine Co., Cincinnati



America Gets Most from Machinery

AMERICA holds a dominating position in the machine tool building industry and she has won this distinction as a result of her mass production system rather than by superior designing intelligence or advantages of foreign trade. European nations are conservative by nature and the characteristic applies to machine equipment which is cared for and operated to secure maximum life. In the United States a machine is run for maximum production regardless of the consequence and when the unit wears out or becomes ineffective, it is thrown out and replaced by a new one. This greater consumption of machine tools has enabled designers to redesign and improve constantly and for many years the products have been of the highest quality obtainable.

Not Widely Employed

Although Americanization of industry has appeared in some European countries, little or no evidence of it is to be found in England. This is the observation of F. W. Bishop, industrial analyst of the Guardian Trust Co., Cleveland, who just recently returned from a visit to his old home in that country. One automobile maker has modernized production lines, but that appeared to be the extent of progress. Commenting on the situation, Mr. Bishop says:

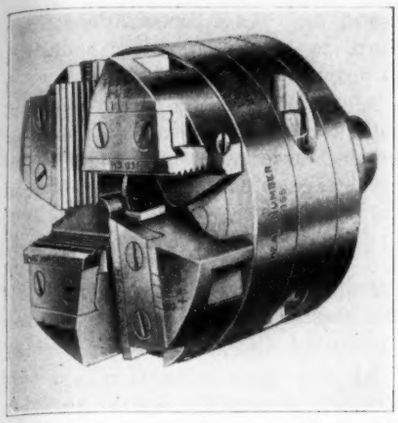
"The English seem to think more of the machine than of the man who runs it. They operate their tools at the speeds at which they will last longest. Americans drive their machinery as fast as it will go, and when it will no longer cut to proper accuracy, they throw it out. Some American manufacturers are properly depreciating their machinery one-third each year on their books, expecting to replace it in about three years, and by that time they will have made more than enough out of the higher speeds to re-equip the plant.

"I suppose the English habit runs back to their love of horses. At any rate, it could not be changed without going down through the whole apprentice system, where the boy is taught to regard the machine tool as a sacred thing. The American viewpoint is as truly American as the habit of drink-

(*Concluded on Page* 1160)

Iron Trade Review's Calendar of New Equipment

No.	Item	Builder	Comment	Date Described
247.	Truing fixture	Gleason Works	For truing circular cutters	Oct. 4
248.	Shaper	Cincinnati Shaper Co.	Wide range of speeds and cross feeds	Oct. 4
249.	Center lathe	Bullard Machine Tool Co.	Independent spindle and tools speeds at each station	Oct. 4
250.	Grinding wheel	Blanchard Machine Co.	Six abrasive segments clamped into chuck	Oct. 4
251.	Riveter	Chicago Pneumatic Tool Co.	Squeezes instead of hammers rivets into place	Oct. 4
252.	Electric drills	United States Electrical Tool Co.	Portable, high speed, ¼-inch type	Oct. 4
253.	Draw-cut shaper	Morton Mfg. Co.	High duty type; 32-inch stroke	Oct. 4
254.	Shape cutter	Linde Air Products Co.	Cuts with oxyacetylene blowpipe; automatic operation	Oct. 4
255.	Assembly press	Hanna Engineering Works	For use in chassis frame riveting installations	Oct. 4
256.	Drill	Ingersoll-Rand Co.	Operated by air motor; for close quarter work	Oct. 11
257.	Cutting material	Sullivan Machinery Co.	Substitute for diamond in diamond core drill bits	Oct. 11
258.	Boring tool	Schmidgall Mfg. Co.	Drills variety of holes in wide range of materials	Oct. 11
259.	Compound crane	Modern Pouring Device Co.	For double crane service on wide crane bay	Oct. 11
260.	Offset miller	Oesterlein Machine Co.	For use in milling operations on screws and bolts	Oct. 18
261.	Arc welder	Westinghouse Electric & Mfg. Co.	For heavy-duty work; operates from direct current	Oct. 18
262.	Trimming press	Chambersburg Engineering Co.	Forged steel side frames; other safety features	Oct. 18
263.	Gas burner	American Heat Economy Bureau Inc.	For firing metallurgical furnaces	Oct. 25
264.	Arc welder	Westinghouse Electric & Mfg. Co.	Gas engine drive; 60-300 amperes welding range	Oct. 25
265.	Grinders	Visey-Wolf Machine Co.	Portable electric; alternating and direct-current types	Oct. 25
266.	Expansion joint	Tobias Miller	Double-guide construction; simple and rigid	Oct. 25
267.	Die head	Landis Machine Co.	For application to automatic screw machines	Nov. 1
268.	Gear tester	Gleason Works	Tests and laps spiral bevel and hypoid gears	Nov. 1
269.	Friction saw	Joseph T. Ryerson & Son Inc.	Circular steel blade mounted on movable carriage	Nov. 1
270.	Slitting shear	National Machine Tool Co.	Portable; can be mounted in a vise or on a bench	Nov. 1
271.	Milling machine	Giddings & Lewis Machine Tool Co.	Table-type; horizontal boring, drilling and milling	Nov. 1
272.	Speed reducers	Farrel-Birmingham Co. Inc.	Herringbone gears; roller bearings	Nov. 1
273.	Speed reducer	D. O. James Mfg. Co.	Worm gear vertical-type; equipped with roller bearings	Nov. 1
274.	Valve operating unit	Cutler-Hammer Mfg. Co.	Motor-driven; automatic operation of valves up to 6-inch	Nov. 1



No. 267—Graduated die head

Die Head Designed for Screw Machines

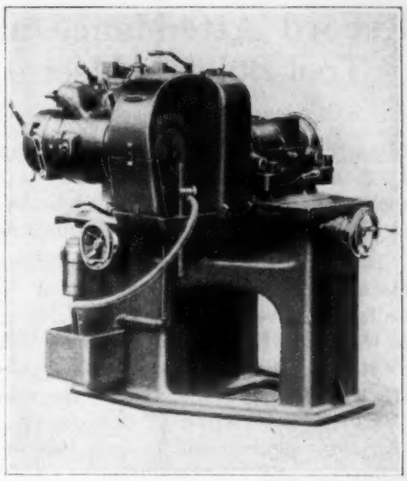
No. 267

Landis Machine Co., Waynesboro, Pa., has placed on the market a new die head designed for application to automatic screw machines. This head is of the rotary pull-off type and is opened by retarding the forward movement of the die holder and closed automatically by an attachment on the automatic screw machine. The device is made of a high grade of carbon steel and is heat treated throughout and ground. The head is flexible on its shank so as to compensate for any misalignment in the machine or the work to be threaded. Chasers are supported on the front face of the head. Use is made of an adjusting worm for adjusting the head to size. The die head is locked within itself under service conditions by the engagement of two hardened closing pins and closing pin bushings. The head-opening spring is located in the adjusting ring. This spring is said to maintain uniform tension for all diameters. The head is made in ½-inch, 13/16-inch and 1⅛-inch sizes. All are graduated, as shown in the accompanying illustration, for bolt and pipe threads within their ranges.

Testing and Lapping Are Done by New Unit

No. 268

Gleason Works, 1000 University avenue, Rochester, N. Y., recently has designed an 18-inch combination testing and lapping machine to test and lap spiral bevel and hypoid gears. The gears are tested first after cutting to show the proper tooth bearing and after hardening they are tested again both for bearing and for noise. A brake on the gear or driven head enables the operator to test them under load. The machine will lap gears up to 18 inches in pitch diameter. The maximum offset obtainable when testing hypoid gears is 3½ inches. The maximum distance from the center of the gear spindle to the nose of the pinion spindle is 12 inches and the minimum distance is 3⅞ inches. When used for lapping, a pump with built-in motor and reservoir for the lapping compound are furnished with the machine. The drive spindle, which is power driven, can be run in either direction. It is provided with a lock for use when tightening and loosening arbor nuts. The pinion spindle head and the gear head column are adjustable horizontally on the frame by means of handwheels which are graduated in thousandths of an inch. A 5-horsepower, 1800 revolutions per minute motor is needed for the main drive in addition to the two smaller motors which provide the oscillating motion and pump drive for the lapping compound.



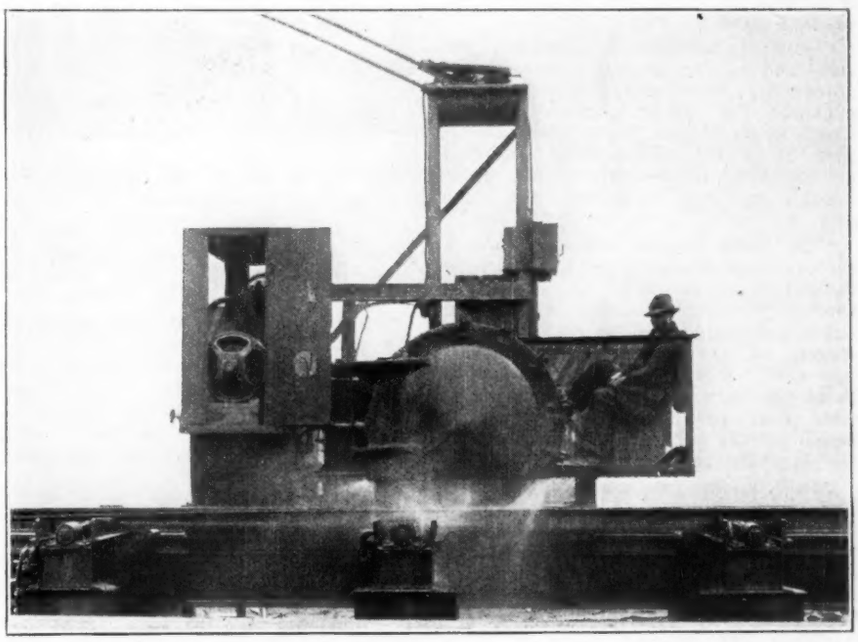
No. 268—Testing and lapping machine

Friction Saw Is Used To Cut Rail Lengthwise

No. 269

Joseph T. Ryerson & Son Inc., Sixteenth and Rockwell streets, Chicago, recently devised a new application for a friction saw in the solution of a specialized cutting problem for a metropolitan traction company. The traction company had been making guard rail by stripping a portion of the base from discarded rails. Cutting off this strip presented a problem to which the friction saw, as shown in the accompanying illustration, was adapted. In this high-speed friction method of cutting, the 56-inch steel blade revolves at a peripheral speed of nearly 5 miles per minute. The edge of the ¼-inch blade is said to cut through a rail section at a rate of 4½ to 6½ feet per minute, depending upon the speed of the feed motor. The machine has an arc welded structural frame and runway upon which the carriage travels. The carriage, also arc welded, carries the 100-horsepower friction saw motor and blade as well as a 3-horsepower motor and reduction unit for propelling the carriage. As the machine moves back and forth on the runway, the pump picks up water from a trough alongside the frame and sprays it over the blade. The water resulting from the spray is collected in a concrete tank and returned to the trough. The operating power, direct current varying from 550 to 650 volts, is taken from two overhead trolley wires through standard street car trolley poles. Two

(*Continued on Page* 1159)



No. 269—Friction saw stripping the base from a rail

Record Attendance at Tool Builders Meet

(*Continued from Page* 1123)

to as the V. D. M. A., was founded in 1892, has 1200 members directly associated with it and 1500 members indirectly associated through 103 unions.

Turning to the United States in his discussion Mr. Kraut stated that in order to solve some of the problems in the marketing of machine tools, we must first adopt uniform sales contracts. While much has been said about the desirability of uniform contracts for dealers and buyers, this instrument still is unavailable. Mr. Kraut introduced a resolution to the effect that the president appoint a committee of five to formulate a standard sales contract which is to be submitted to the various groups at the next convention. This resolution was adopted unanimously.

At the close of this session several manufacturers who have been experimenting with a six-month guarantee clause and a service charge of $15 per day and expenses for demonstrators and service men, recounted their experience. Warren S. Hays of the Power Transmission association spoke briefly on opportunities for co-operation between his association and the tool builders association.

At the Thursday afternoon session, Dr. Hugh Baker, manager trade association department, Chamber of Commerce of the United States, Washington, spoke on "What Trade Associations Mean to Industry." Dr. Baker defined trade associations as an organization of business men and their serving the business or trade for the development of mutual service and for better business. He spoke briefly of the new trade association department of the Chamber of Commerce of the United States and explained that it has three objects: First, to sell trade associations to members, to the public, and to the government; second, to make the Chamber of Commerce more useful to trade associations; and third, to help unorganized industries to organize trade associations on a

Albert E. Grover, staff cost consultant of the National Machine Tool Builders association, presented a comprehensive study of the results of various methods of cost finding employed by machine tool builders. At the outset and frequently throughout the discussion, Mr. Grover emphasized this slogan: "Effort Spent on Incorrect Costs Is a Complete Loss."

At the final session held Friday morning, Ernest F. DuBrul spoke on "Profit Ideals of the Machine Tool Industry." This discussion was based on reports from member companies to a bulletin entitled "How Ought the Machine Tool Builder Figure Profits?", which had been issued several months prior to the meeting. J. R. Porter, president, Marshall & Huschart Machinery Co., Chicago, outlined some of his experiences in the selling of new machinery when prospective buyers want to turn in used machines.

Business Good, But Be Careful, Warns DuBrul

THE Wednesday evening session consisted largely of a business meeting. In his report as general manager of the association, Ernest F. DuBrul presented a carefully worded analysis of the state of the machine tool industry. He said:

"We have been made happy each month of the last nine, to note that our index has run decidedly higher than for any similar period since the postwar boom. In eight months up to Sept. 1 the index indicated a greater business booked than in all of last year.

"General business is decidedly active, and as far as can reasonably be forecasted now, this activity should continue for some months. At this time, when things seem most favorable, it is not pleasant to comment on signs and portents of an unfavorable nature; yet there are such and we should not neglect them.

"The stock market situation is one factor that probably will react unfavorably on business. According to the very valuable index of normal stock values, devised by Col. Leonard Ayres, of the Cleveland Trust Co., prices of stocks are now more than twice as high above normal as they have ever previously gone at the peaks of the wildest bull markets of the last 29 years.

"This is not a healthy situation. The stock boom is being financed on credit, of course. Borrowings of member banks from the reserve banks do not now have the same solid foundation of gold that they had a year ago.

"When the present wave of stock speculation breaks, the break will probably affect business adversely, as such breaks always have done in the past.

High up in the Pocono mountains of Pennsylvania

"It was precisely at such times in the past when the machine tool industry needed the most careful policies. Now that business research has traced out the pattern of those former pictures, we can reasonably take these signals as telling us to be well prepared for a slump.

"In times like these it is much better to have money to lend than to be compelled to borrow. So let us remember that machine tool inventories have no coupons attached to be cashed at regular intervals. Let us remember the disasters that excessive inventories caused in the last big slump."

Turning to the internal affairs of the association, Mr. DuBrul announced the addition of three new members, namely the Buffalo Forge Co., Logansport Machine Co., and Hall Planetary Co. He also described in detail the progress being made by the various committees and by the association staff. Edward A. Mueller, president and treasurer, King Machine Tool Co., Cincinnati, and treasurer of the association, presented the financial report of the association and a report on the budget for 1928 and 1929 which was approved. James E. Gleason, Gleason Works, Rochester, N. Y., presented a report of the nominating committee, naming three directors as listed elsewhere, who were unanimously elected.

Of the various committee reports which followed, greatest interest surrounded that of the exposition committee, which was presented by Mr. DuBrul in the absence of Chairman J. Walter Carrel, Cincinnati, who is in Europe. It was reported that although no solicitation for space had been made, applications thus far received are for approximately 82,000 square feet. Of this space 60,000 feet is requested for members of the association, 9000 for non-member machine tool builders and 13,000 by manufacturers of machine tool accessories. The total space for which applications have been received is far in excess of the space used in 1927 at Cleveland.

Editorials

Quality and Service—for Nothing

THE per-ton cost of steel is not the controlling factor of the production costs of consumers of steel. Quality and service are even greater considerations; often a cheaper steel is more costly to fabricate. This quality and service many of us are rendering to the consumer, but he is not paying for them. Three to five dollars more per ton would not affect the business of most consumers and to the steel industry it would mean the difference between something and nothing."

Few observations at last week's meeting of the American Iron and Steel institute at New York were more impressive than this by George M. Verity, president of the American Rolling Mill Co. They epitomized the opinion that while prices are more remunerative—one executive pronounced the present the best era since 1920—still they leave something to be desired.

In recent years consumers of steel have tended to become more exacting in their requirements. They specify material that must take a deeper draw or a better finish or in some other manner be subjected to more rigorous conditions of fabrication. All this has imposed an added burden not only of production but also of inspection and shipment upon the steel industry and prices, instead of rising to recompense for the additional cost, have been declining.

The tendency of prices to rise in the past six months has helped correct this situation. It is inevitable that demand for steel subside from its present high level, and then will come the real plumbing of the market's strength. Six months ago the steel industry, made vocal at the May meeting of the institute, was striving for higher prices. Now its problem appears to be to hold its gains. Contraction in demand has rarely failed to develop price concessions, but there is a moderating influence this time in the show of solidarity being made by the larger producers.

Scrap Prices Sensitive to Demand

SCRAP has occupied a large share of the limelight in iron and steel markets during the past three months, taking the lead in the price upturn of that period. Heavy melting steel sold as low as $14 a ton, Pittsburgh, early in July. By mid-August it had climbed $1.50, had added a like amount one month later, and recently advanced to $18, the highest in over two years. This increase of $4 in three months eclipsed the substantial appreciation in pig iron in the same period.

This spurt of heavy melting steel was simply a demonstration of supply and demand. Steelmaking operations were maintained at a record level the first seven months of 1928, paralleled by scrap consumption. Dealers' stocks, as a result, decreased steadily. In addition, some railroad offerings normally going to dealers were diverted directly to the mills.

When steel production refused to follow the usual seasonal trend downward in August, a slight shortage appeared in scrap supplies and higher prices followed. The influence of the rising market served to dam sources from which small streams of scrap usually originate, and dealers who had sold short at higher levels encountered difficulty in covering. Their demand served further to strengthen the market. Price advances in other sections prevented outside scrap from moving to the Pittsburgh district. Some mills formerly regarded as self-contained in scrap have been forced to enter the market and have helped to strengthen it.

Steelmaking operations appear to hold the key as to when the current movement will expire. Should consumption decline materially, dealers look for the supply and demand law again to legislate, this time in the opposite direction. But the general outlook appears to preclude such a move in the immediate future.

Weather and Crops Affect Steel

AGRICULTURE is not the only major industry dependent in some degree on the favor of the seasons and affected favorably or adversely by the whims of nature. The present year affords an example of the large influence of nature in the sale of tin plate. It has been an unusually active year for makers of this product, though at the moment demand is not so large as earlier in the year, due to the operation of seasonal factors.

Causes of the large demand for tin plate are not difficult to find and they reside entirely in nature's working. In the case of the salmon pack, which absorbs a heavy tonnage of tin plate for containers, the Alaskan fisheries packed 5,500,000 cases up to Aug. 31, compared with 3,500,000 cases for the entire season of 1927. Due to a successful

selling campaign the large pack will not leave a surplus to slow business next year, as over 80 per cent of the pack is said to have been sold already at advanced prices.

Of other materials requiring much tin plate for containers, the pea crop has been heavy and the pack large. Other crops preserved in tin have not fallen below average size and the result has been unusual demand for the plate.

This is the most direct bearing of weather and crop conditions on the iron and steel industry, though general conditions in agriculture have an effect in stimulating or depressing demand for articles used in the agricultural areas, fencing, nails and agricultural implements, for example.

Equipment Reserve Not Needed

THE manner in which the Pittsburgh district is meeting its handicaps of western basing points, the slow but steady movement westerly of the center of iron and steel consumption, and the more rapid expansion of iron and steel production in the Chicago and Birmingham districts is typified by the district's resort to its rivers.

In September the movement of iron and steel over the Monongahela river set a record for all time at 136,227 tons. In August only 109,738 tons was carried, and in September a year ago 102,778 tons. In the nine months of 1928 ended with September more iron and steel was barged on this river than in any previous full year. The 817,001 tons moved in the first nine months of the year compares with 469,688 tons in the same period of 1927.

The railroads cannot be expected to regard this revival of river traffic with equanimity, yet those losing business to it cannot be as critical as those hit by the increasing resort to the Great Lakes trade in iron and steel. Railroads in the latter district must maintain sufficient equipment to meet the peak load imposed when navigation closes, but in the Pittsburgh district the trend toward year-round movement on the rivers lessens the reliance on the railroads and calls for little or no reserve of rail equipment.

Britain Wrestles With Tariff

STEELMAKERS in Great Britain, suffering from the heavy imports of steel from the continent in recent months, are using every endeavor to obtain an import duty under the law known as the safeguarding of industries act. At the moment the price situation is such that continental steel is not being imported, but only a few weeks ago the tonnage coming in was heavy. At that time other efforts were made to prevent this inundation by a bonus on steel produced at home but with little effect.

The English people always have stood strongly for free trade and those in authority now apparently fear to give the relief asked by steelmakers. Their requests are deferred until the elections of next year. Meanwhile, the industry is in uncertainty as to its fate should conditions change and continental steel prices decline sufficiently to make importation possible.

One obstacle to an import duty is found in the attitude of the industries which transform finished steel into the ultimate products ready for sale to the public. These interests oppose anything which will tend to increase prices of raw materials.

The people of Great Britain apparently feel that protection by a tariff on steel and iron would be the entering wedge to general protection and to this they are basically opposed. The outcome of this struggle is of interest in view of the solution of the tariff achieved in this country and the results that have followed.

What Our Readers Are Thinking

Opposes Direct Selling To Trade

To the Editor:

THE enclosed copy of our letter of Oct. 1 was sent to every hardware jobber as well as every mill supply distributor in the United States. We trust that a definite statement from the manufacturer such as contained in this letter will tend toward cementing better relationship between the jobber and manufacturer, especially in the present day when the problems of distribution are of such importance.

We believe this to be a definite move in the right direction and hope that the benefits may be fully realized from such action.

"Gentlemen: The success of our business and the position which we occupy in the hacksaw industry has been predicated on a policy of strict adherence to recognizing the hardware jobber and the mill supply house as the legitimate distributors of our product. This fact is to an extent generally recognized but the object of this letter is to set same before you fearlessly and unmistakably.

"We have no interest in the taking of direct consumer business inasmuch as it is in direct competition with the distributor. It is our desire that the large direct consumer purchase through the proper channels.

"The responsibility for the maintenance of this policy devolves to a large extent upon the distributor, and we bespeak your whole hearted co-operation to the end that you may profit in a measure more commensurate to your investment of time, labor, and money."

WILLIAM E. CROSS, *Treasurer, Directing Sales, Clemson Bros. Inc.*

Middletown, N. Y., Oct. 2, 1928.

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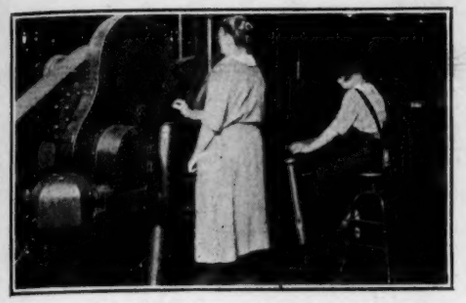

Commercial Nuts Made on Mass Production Basis. Page 1119.

HOW to hold price gains made in the steel market in the past six months was the theme of the American Iron and Steel institute, in New York, Friday, Oct. 26. Six months ago the institute discussed the dire need for improvement, through the adoption of a firmer attitude for fair prices. Since then business has expanded beyond expectations, by reason of general requirements for material, and prices have been better. Producers now foresee the inevitable lull in the future. The articles beginning on pages 1111 and 1114 indicate how they hope to meet the new situation.

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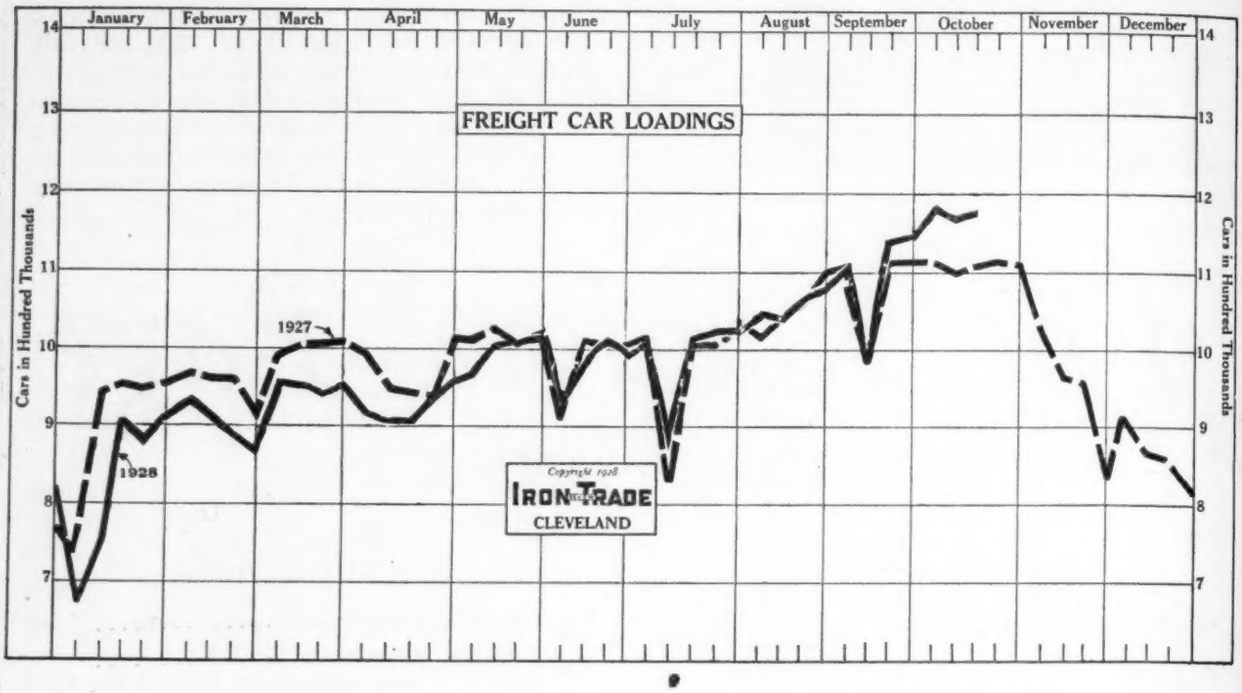
The Business Trend



Freight Movements Expanding

By JOHN W. HILL, Financial Editor

EVIDENCES of increasing business activity are accumulating. In some lines of industry, such as automotives, there is some seasonal slowing down, but even this is less than customary. Perhaps the most impressive signs of what actually is taking place are to be found in the recent unexpected spurt in construction in the face of high money rates, and the expansion of freight movements.

DURING the early part of the year car loadings lagged behind both 1927 and 1926. That condition has now been emphatically reversed. The reasons for the retarded freight movements in the early months of 1928 were to be found in the bituminous coal industry and in the belated iron ore season. Big crop movements and an extraordinary distribution of autumn merchandise have caused car loadings to shoot forward.

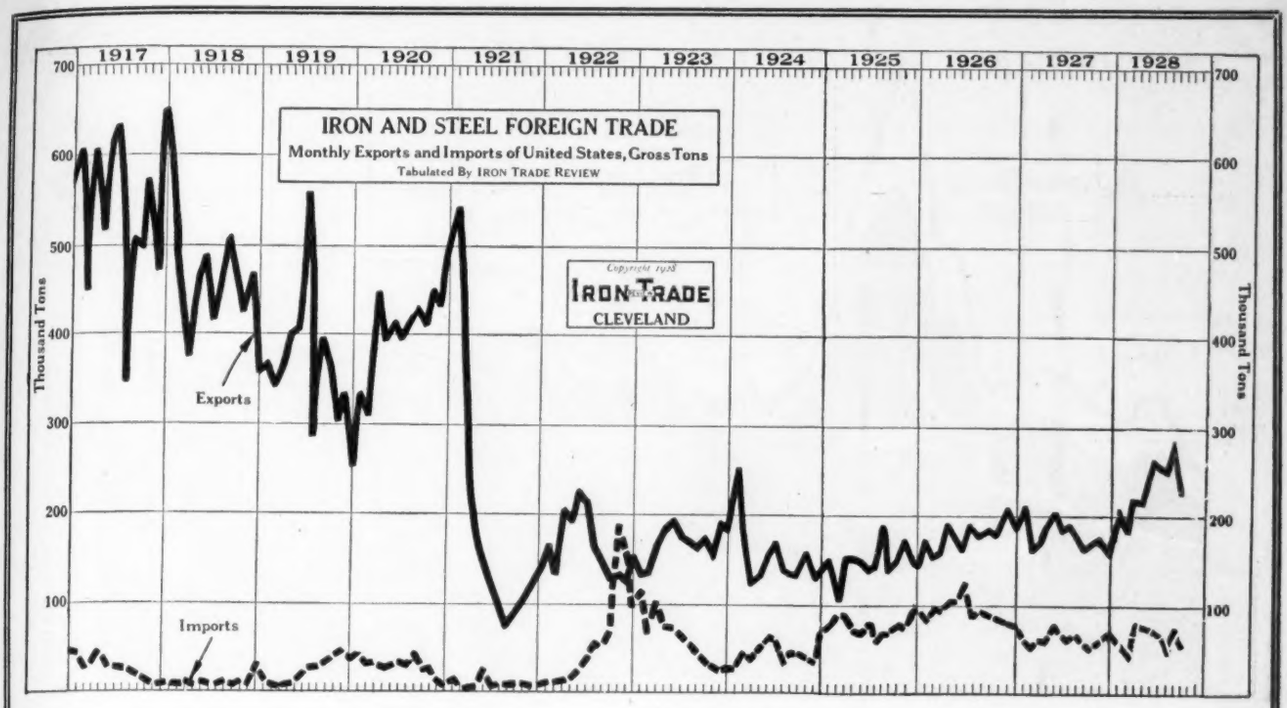
DURING the week ended Oct. 13 the aggregate of car loadings was 1,190,127. This was second only to the peak week of 1,196,000 cars in the week ended Sept. 29. It compared with 1,102,000 cars for the like week of 1927 and with 1,174,000 in the corresponding period of 1926.

FROM all indications the remainder of the year will bring one of the greatest periods of goods distribution ever known. According to many reports, merchants' shelves throughout the country are but poorly stocked due to the policy of hand-to-mouth buying. At the same time, after some months of slow retail distribution, consumers are believed to be under-bought.

THIS fact, together with the approach of the holiday season and the stimulus of important agricultural buying based on big harvests, promises large volumes of trade. At least one leading business forecaster, The Brookmire Economic Service, warns of the possibility of a car shortage and urges modification of hand-to-mouth buying and a more generous accumulation of stocks.

IN RECENT years there has been nothing approaching a car shortage. Increased efficiency has made up for small purchases of new freight cars. With all signs pointing to big demands for transportation service next year, increased buying of equipment by railroads to meet requirements of the country is a distinct possibility. In fact evidence of this is already appearing.

The Business Trend

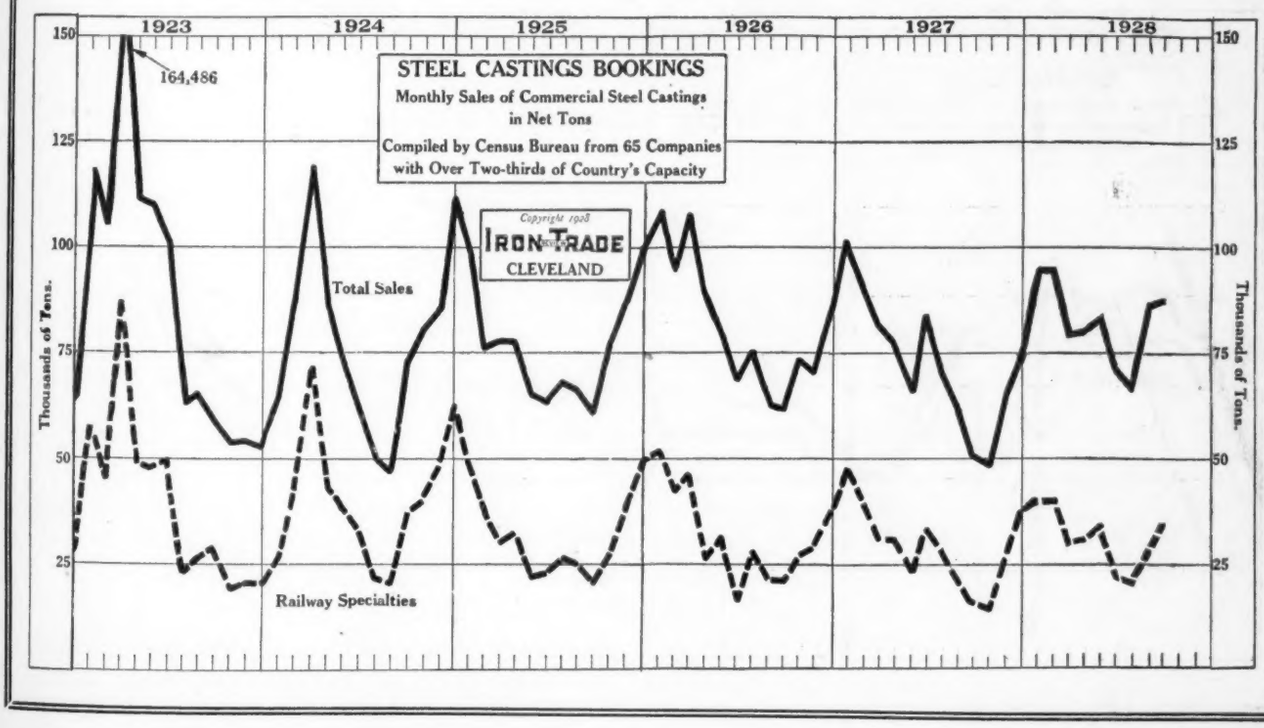


Steel Foreign Trade

BOTH exports and imports of iron and steel products declined in September. Outward shipments amounted to 228,056 tons compared with 287,297 tons one month before. The month's exports showed a gain over those of 166,352 tons one year before, however. Imports were 57,782 tons against 69,914 tons in August and 58,464 tons in September, 1927. Nine months' exports were 2,127,431 tons against 1,165,864 tons for the like period of 1927. Imports were 565,421 tons against 571,413 tons in 1927.

Steel Castings

NEW orders for steel castings in September, as reported to the department of commerce by leading manufacturers, were 57 per cent of shop capacity against 36 per cent one year ago. Orders amounted to 82,173 tons compared with 81,400 tons one month before and 52,351 tons one year ago. Orders for miscellaneous castings declined, but there was an important gain for railway castings, the total being 35,234 tons against 25,171 tons in August and 18,396 tons one year before.



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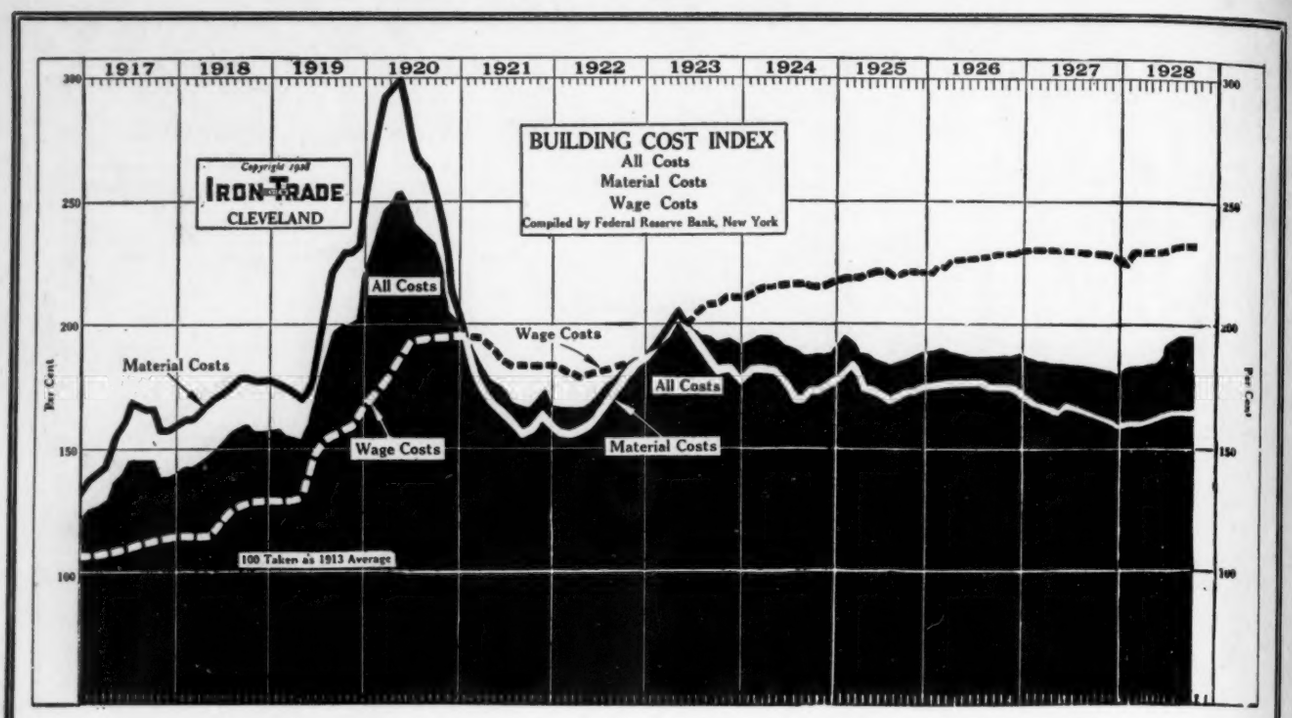
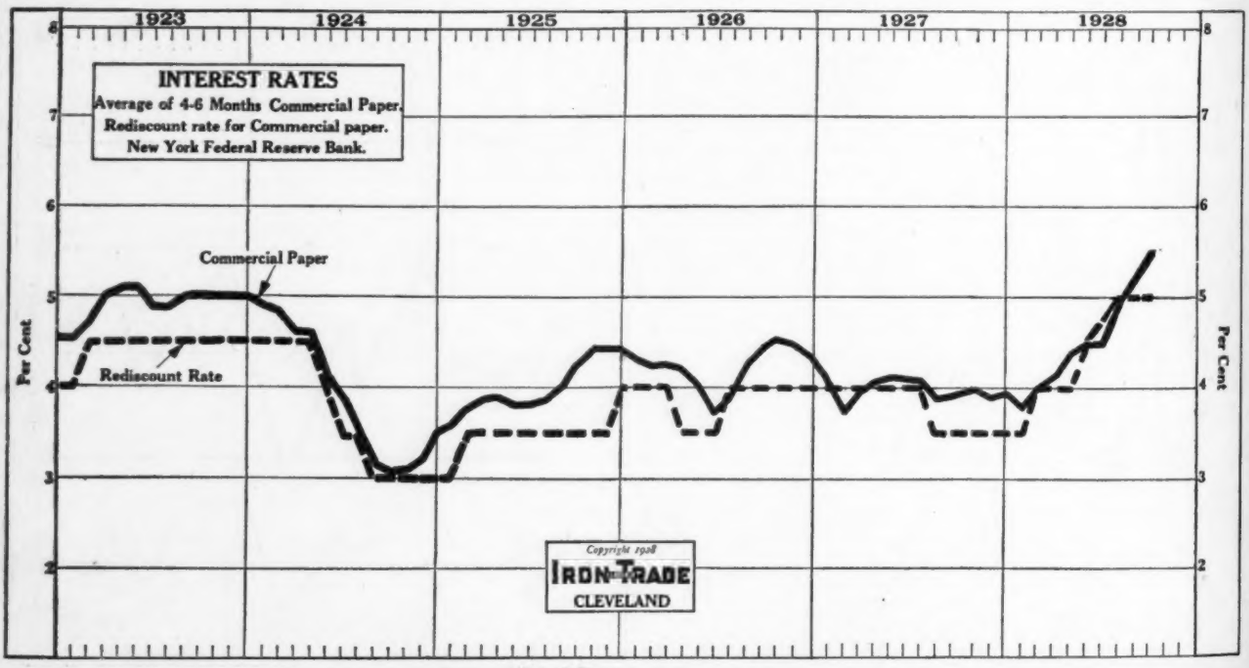


Building Cost Index

BUILDING costs have been at a steady level recently. During September the indexes of various important items which go to make up building costs showed no change from the preceding month. Wages stand at 133 per cent over the prewar base, a new high record, comparing with 129 per cent over prewar one year ago. All costs of construction are 91 per cent over the 1913 level, compared with 88 per cent over 1913 one year ago. Materials are 63 per cent higher against 60 per cent one year ago.

Interest Rates

ALTHOUGH the closing days of October brought a flurry in the money market with as high as 8 per cent for call money on the New York stock exchange, the peak of autumn credit demand has passed. Easier tendencies are evident in the time money market, with the supply greater. Nevertheless, interest rates remain at the highest point for this season in about seven years. Commercial paper rates are 5½ per cent while the New York rediscount rate is unchanged at 5 per cent.



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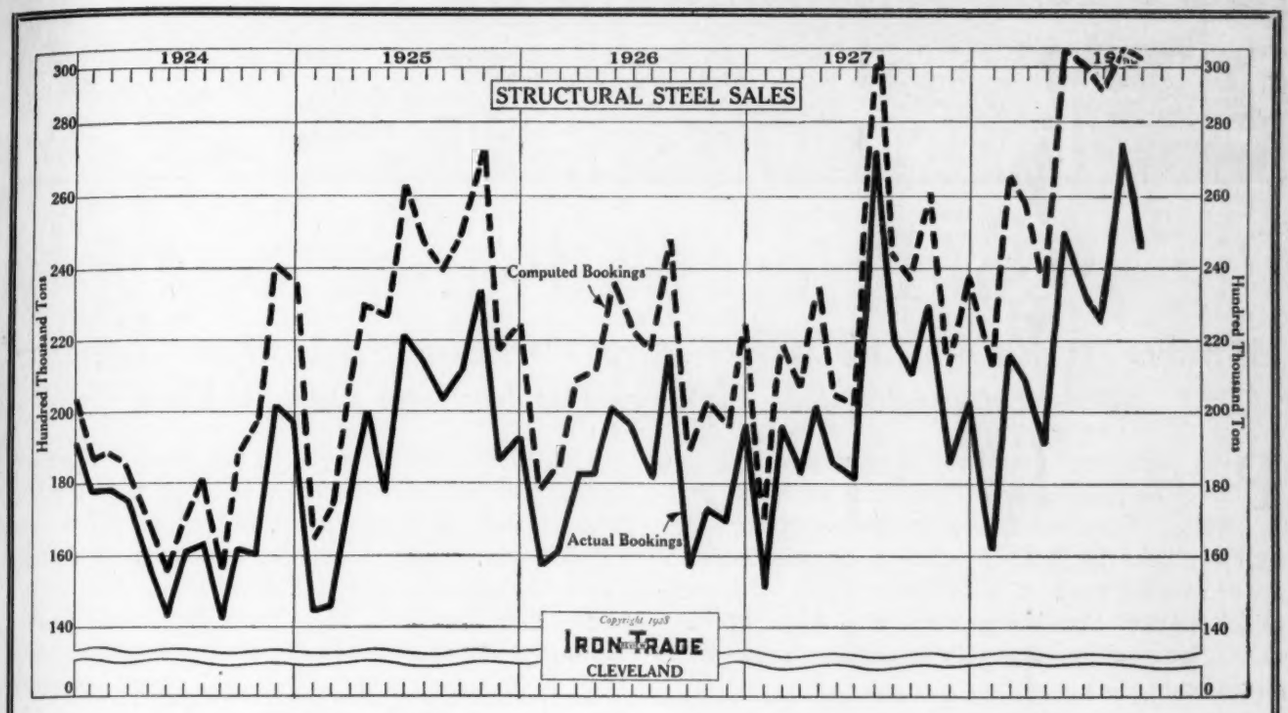
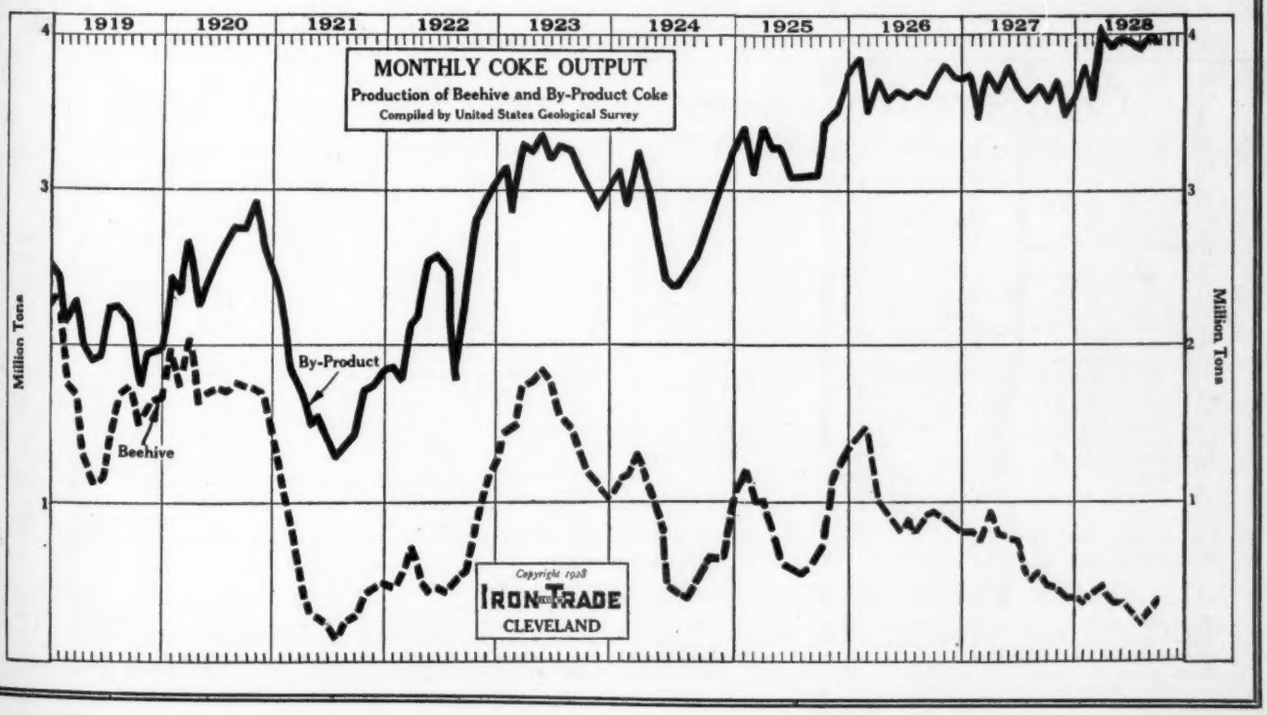


Structural Awards

ALTHOUGH computed tonnage of structural awards, as reported to the department of commerce, declined somewhat in September, they held at a high level and were the second largest for any month this year. The total for the month was 315,000 tons against 356,250 tons one month before and 262,250 tons in September, 1927. Actual tonnage reported by 201 firms amounted to 243,942 tons against 285,508 tons in August and 217,109 tons in September of the preceding year.

Monthly Coke Output

THE undertone of the beehive coke market has been holding strong with demand definitely improved. Total production of beehive coke in September was 312,000 tons compared with 288,000 tons in the preceding month and with 271,000 tons in July. Production of by-product coke in September amounted to 3,958,682 tons compared with 3,994,924 tons in August and 3,911,000 tons in July. Coking coal consumption in September was 6,180,000 tons, of which 5,688,000 was used by by-product plants.



Pig Iron Prices Advance Sharply

Markets Sensitive to Low Supply—Steel Correcting Its Position—Tonnage Needs Dominate Steel Inquiry—October Iron Output Rises

PIG iron has decisively superseded finished steel as the leader of the iron and steel markets. Continued heavy consumption, negligible stocks on both producers' and consumers' yards, withdrawal of steelworks from the merchant market and the gradual shrinkage of merchant ironmaking capacity combine for a tight situation.

Basic Tonnage Finds No Takers

Forty-five thousand tons of basic iron is on inquiry by northern Ohio consumers, and an offer of $17.50, valley, or $1.25 over the market of thirty days ago, has proved futile. Bessemer iron at $18, valley, represents an advance of $1 per ton over a month ago. Supplies of both grades continue to grow scarcer.

The second 50-cent rise at Buffalo in two weeks affects distant as well as local sales. At Detroit the foundry and malleable grades both are up 50 cents. Chicago producers have announced the fourth 50-cent rise since Aug. 20. At Cleveland 42,000 tons has been sold in the past week. St. Louis sales have been the heaviest of the year.

This picture of strength in pig iron is rounded out by production, which in October rose to the highest daily average in seventeen months. At 107,549 tons the October rate compares with 102,120 tons in September and 90,710 tons last October. The month's total was 3,334,024 tons, against 3,063,530 tons in September and 2,812,015 tons in October, 1927. October's good showing puts the ten-month total for 1928 ahead of the similar period of 1927, the comparison being 31,117,786 tons to 30,929,041. Despite numerous changes, the number of active blast furnaces at the close of October was the same as at the end of September—194.

Production Also Past Its Peak

Finished steel, meanwhile, continues to correct its position. Three weeks after a similar development in demand, production has passed the crest of the present bulge and is receding moderately. It may be that prices, which recently have been subordinate to prompt delivery, will also undergo some pressure. Only last week Charles M. Schwab, president of the American Iron and Steel

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Oct. 31, 1928	Sept., 1928	July, 1928	Oct., 1927
PIG IRON				
Bessemer, del., Pittsburgh	$19.76	18.86	18.76	19.76
Basic, valley	17.50	16.10	15.95	17.00
Basic, eastern, del. eastern Pa.	19.75	19.00	19.00	19.50
No. 2 foundry, del., Pittsburgh	18.76	18.61	18.26	19.26
No. 2 foundry, Chicago	19.50	18.30	17.60	18.75
*Southern No. 2, Birmingham	16.25	16.25	15.50	17.25
*Southern Ohio, No. 2 Ironton	18.00	19.00	19.00	19.00
**No. 2X, Virginia furnace	20.50	20.50	20.50	21.50
**No. 2X, eastern, del. Phila	21.26	21.01	20.76	20.66
Malleable valley	17.50	17.10	17.00	17.50
Malleable, Chicago	19.50	18.30	17.60	18.75
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.26	18.01	18.76	18.76
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	94.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.90	2.75	2.60	2.85
Connellsville, foundry, ovens	3.75	3.75	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.00	33.00	34.00
Sheet bars, open-hearth, Pittsburgh	33.00	33.00	32.25	34.00
Billets, open-hearth, Pittsburgh	33.00	32.00	32.25	33.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.50

	Oct. 31, 1928	Sept., 1928	July, 1928	Oct., 1927
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.95	1.90	1.85	1.75
Steel bars, Chicago	2.00	2.00	2.00	1.85
Steel bars, Philadelphia	2.27	2.22	2.17	2.07
Iron bars, Chicago	2.10	2.00	2.00	1.90
Shapes, Pittsburgh	1.95	1.85	1.85	1.75
Shapes, Philadelphia	2.11	2.06	2.01	2.07
Shapes, Chicago	2.00	2.00	2.00	1.85
Tank plates, Pittsburgh	1.95	1.90	1.85	1.75
Tank plates, Philadelphia	2.15	2.10	2.10	2.07
Tank plates, Chicago	2.00	2.00	2.00	1.85
Sheets, black, No. 24, Pittsburgh	2.75	2.65	2.65	2.95
Sheets, blue anl., No. 10, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, gal., No. 24, Pittsburgh	3.50	3.50	3.50	3.80
Sheets, black, No. 24, Chicago	2.90	2.85	2.80	3.10
Sheets, blue anl., No. 10, Chicago	2.15	2.15	2.15	2.35
Sheets, galvanized, No. 24, Chicago	3.65	3.65	3.65	3.95
Plain wire, Pittsburgh	2.40	2.40	2.45	2.40
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.30
SCRAP				
Heavy melting steel, Pittsburgh	17.50	16.55	14.10	14.50
Heavy melting steel, eastern Pa.	16.00	14.65	12.75	14.00
Heavy melting steel, Chicago	14.00	12.95	12.30	11.75
No. 1 wrought, eastern Pa.	15.50	15.10	15.25	15.75
No. 1 wrought, Chicago	13.70	12.95	12.30	11.40
Rails for rolling, Chicago	16.50	15.90	14.50	14.70

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.15c to 2.20c
New York, del.	2.225c to 2.27oc
Boston, del.	2.265c to 2.415c
Chicago	2.00c to 2.10c
Cleveland, delivered	2.09c to 2.19c
Lackawanna, N. Y.	2.00c
Birmingham	2.15c
Pacific Coast, c.i.f.	2.20c to 2.30c

STRUCTURAL SHAPES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.08c to 2.11c
New York, del.	2.19c to 2.24c
Boston, del.	2.265c to 2.415c
Chicago	2.00c to 2.10c
Cleveland, delivered	2.09c to 2.19c
Lackawanna, N. Y.	2.05c
Birmingham	2.15c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh	1.90c to 2.00c
Chicago	2.10c
Birmingham	2.15c
Lackawanna, N. Y.	2.05c to 2.10c
Pacific Coast, c.i.f.	2.35c
Cleveland	1.90c to 2.05c
Philadelphia, del.	2.22c to 2.32c
New York, delivered	2.24c to 2.34c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.95c
Eastern mills	1.85c

IRON

Chicago	2.00c to 2.10c
New York, delivered	2.14c to 2.24c
Philadelphia, delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh billet, cut lengths	2.25c
Stock lengths from mill	2.00c
Chicago, billet	2.30c to 3.00c
Chicago, rail steel	2.00c to 2.60c
Chicago, rail steel, road and bridge work	1.85c to 1.95c
Philadelphia, cut lengths	2.57c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Shafting (turned, polished) Pittsburgh	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.55c to 3.00c
Cold finished steel bars, Cleve.	2.25c

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.00c to 4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh base	2.75c
No. 24, Philadelphia, delivered	3.07c
No. 24, Gary, Lndiana Harbor	2.85c
No. 24, Chicago, delivered	2.90c
No. 24, Birmingham, base	2.90c

TIN MILL BLACK

No. 28, Pittsburgh, base	2.90c
No. 28, Gary, base	2.95c to 3.00c

GALVANIZED

No. 24, Pittsburgh, base	3.50c to 3.60c
No. 24, Philadelphia, delivered	3.82c
No. 24, Gary, Indiana Harbor	3.60c
No. 24, Chicago, delivered	3.65c
No. 24, Birmingham, base	3.65c

BLUE ANNEALED

No. 10, Pittsburgh, base*	2.00c
No. 24, Philadelphia, delivered	2.32c to 2.42c
No. 10, Gary, Indiana Harbor	2.10c
No. 10, Chicago, delivered	2.15c
No. 10, Birmingham, base	2.15c

*Plus 0.10 cents for 45 inches or wider.

AUTOMOBILE

No. 20, Pittsburgh, base,	4.00c

FURNITURE

No. 24, Grade A, Pittsburgh	3.85c to 3.90c
No. 24, Grade B, Pittsburgh	3.65c to 3.70c

(*Turn to the following page*)

institute, warned of the futility of cutting prices as demand ebbs.

This easing of the strain in finished steel by no means dims the outlook. Many producers of steel sense that the market has made rapid—perhaps too rapid—strides in the past sixty days and that a period for establishing sound values must precede the further progress indicated by basic factors. Some seasonal factors are at work and while the effect of the national election has been minimized, its imminence cannot be overlooked.

Backlogs Help Operating Schedules

The character of steel demand has changed in this period of adjustment. While general buying has subsided, inquiry for tonnage requirements, which was so marked last week in the railroad equipment market, has developed rapidly. October undoubtedly has set the fourth consecutive monthly ingot production record. Backlogs accumulated by the mills since early September are cushioning the present easier tendency in mill schedules.

Soft steel bars at Chicago and sheets and strip in the Pittsburgh and Youngstown districts are notable exceptions to this moderate reaction. Specifications for bars, especially from forging interests, have been at the heaviest rate of the year in the Chicago district. New business in strip, chiefly from the automotive users, has equaled shipments. Sheet demands in the Pittsburgh and Youngstown districts continue to tax mill capacity. In addition to heavy tonnage in prospect from freight car programs, plate mills will benefit from growing oil country needs. Chicago mills have booked 10,000 tons for southwestern tankage and have 5000 tons more on inquiry. A pipe line for Philadelphia and a steamship placed with the New York Shipbuilding Corp. each calls for 7000 tons.

Big Car Programs Are Shaping Up

Freight car awards in October are tentatively placed at nearly twice the 1378 of September but the bulk went to the railroads' own shops. Nearly 5700 cars are now pending, exclusive of a prospective 3000 each for the Missouri Pacific and Wabash and indefinite programs by the Illinois Central, Santa Fe and Frisco lines. The Pennsylvania railroad has distributed 159,600 tons of rails, a western carrier has ordered 40,000 tons at Chicago, and the New York Central nears action on 190,000 tons.

Steelmaking operations this week average just over 85 per cent, with Steel corporation subsidiaries at 86 per cent and independents at about 88. Chicago and Mahoning valley mills are at 85 per cent, the Pittsburgh district at 85 to 88 per cent and Buffalo at 90.

Pacific coast users of steel bars have been heavy buyers on the Continent, states an IRON TRADE REVIEW cable. Far East is buying tin plate. The IRON TRADE REVIEW composite of fourteen leading iron and steel products continues to rise, advancing 10 cents this week to $35.73, the highest since April.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Oct. 31, 1928)	$35.73
Last week (Oct. 24, 1928)	35.63
One month ago (September, 1928)	35.19
Three months ago (July, 1928)	34.91
One year ago (October, 1927)	35.67
Ten years ago (October, 1918)	57.53
Fifteen years ago (October, 1913)	24.91

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED
SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts..... 1.90c to 2.00c
Hot strip, 6 to 24-in., Pitts.... 1.80c to 1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut length, 1.90c to 2.00c plate basis, or 2.00c blue annealed basis.
Hot strip, bands, under 3-in. Chicago 2.30c
Hot strip, bands, 3 to 6-in., Chi. 2.20c
Hot strip, bands, 3 to 12-in., Chi. 1.85c to 2.00c
Hot strip, 12 to 24 in., Chi..... 2.10c
blue annealed sheet basis.
Cold rolled strip, hard coils, 16 inches and wider by 0.100-inch and heavier, base Pitts., Cleve., (3 tons and over)..... 2.75c to 2.95c
Worcester, Mass. (3 tons and over) ..... 3.00c to 3.10c

ALLOY STEEL

Hot Rolled
F.o.b. Mills

Alloy Quality Bar Base is 2.65c to 2.75c

S.A.E. Series Number	Alloy differential	Net, 100 lb. bars
2000	0.25	$3.00
2100	0.55	3.30
2300	1.50	4.25
2500	2.25	5.00
3100	0.55	3.30
3200	1.35	4.10
3300	3.80	6.55
3400	3.20	5.95
4100 0.15-0.25 Mo.	0.50	3.25
4100 0.25-0.40 Mo.	0.70	3.45
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.80
5100 0.60-0.90 Cr.	0.35	3.10
5100 0.80-1.10 Cr.	0.45	3.20
5100 Chrome Spring	0.20	2.95
6100 Bars	1.20	3.95
6100 Spring Steel	0.95	3.70
Chrome Nickel Vanadium	1.50	4.25
Carbon Vanadium	0.95	3.70
9250 (flats)	0.25	3.00
9250 (rounds, squares)	0.50	3.25

TUBING

Boiler

Carload Discounts—Less-carloads 4 points
Lower—F.o.b. Pittsburgh Mills
Steel 3¼ to 3¾-inch 42½
Charcoal iron, 3¼ to 4½-inch 9
Seamless hot rolled 3¼ to 3½-inch.... 56
Further discounts of six 5 per cents for 21,000 pounds or more on lap welded steel. On charcoal two 10's and one 2½ on 12,000 pounds or more.

COLD DRAWN SEAMLESS

F.o.b. mill in desirable quantities
Random lengths, over 5 feet..... 55 per cent
Selected lengths, 1 to 18 feet ..... 53 per cent

WIRE PRODUCTS

To Jobbers in Carloads

F.o.b. Cleveland and Pittsburgh base
Dealers 10 cents per 100 pounds extra

Bright plain wire, No. 9 gage.. 2.40c
Annealed fence wire 2.55c
Galvanized wire, No. 9 gage.... 3.00c
Barbed wire, painted 2.95c
Barbed wire, galvanized 3.20c

Per 100 lbs.
Wire nails $2.55
Galvanized nails, plus differ. 4.55
Polished staples 3.00
Galvanized staples 3.25
Coated nails, 100 lb. kegs, Sept. 1, 1926 extras apply.... 2.55
Woven wire fencing (retailers) 12½ gage, 26-in. high, 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts. $20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

CAST IRON WATER PIPE

Prices per net ton
Class B pipe

Six-inch and over, Birming'm $36.00 to 37.00
Four-inch, Birmingham ..... 40.00 to 41.00
Four-inch, Chicago ..... 48.20 to 49.20
Six-inch to 24-inch, Chicago.... 44.20 to 45.20
Four-inch, New York ..... 40.50 to 41.60
Six-inch and over, New York 36.60 to 37.60
Standard fittings, Bir. base..... $100.00

Six to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50*
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago, del., 2½ points less.
*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent on galvanized by 1½ points with a supplementary 5 per cent.

CHAIN, PILING, CUT NAILS

Cut nails, c.l., f.o.b. mills..... 2.70c
Cut nails, l.c.l. f.o.b. mills..... 2.80c
Chain, 1-in., proof coil, Pitts.... 6.00c
Sheet piling base, Pittsburgh.. 2.25c

RAILS, TRACK MATERIAL

Standard bessemer rails, mills $43.00
Standard open-h'th rails, mill $43.00
Relaying rails, St. Louis.....$24.00 to 31.00
Relay rails, Pitts. 60 to 90 lb...$22.00 to 27.00
Light rails, 25 to 45, mills $36.00
Angle bars, Chicago base 2.75c
Spikes, railroad, Pittsburgh.... 2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts..... 2.80c
Spikes, boat and barge, Pitts. 3.00c
Spikes, railroad, Chicago 2.80c
Track bolts, Pitts., steam roads 3.80c
Track bolts, Pitts., stand, jobbers .....70 off list
Track bolts, Chicago 3.80c
Tie plates, Chicago, Pitts..... $43.00

BOLTS AND NUTS

Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.
Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread .....60 to 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Eagle list ..... 60 to 70 off

MACHINE BOLTS

All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Lag screws ..... 60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads..... 60 to 70 off
Tap bolts ..... 60 to 70 off
Blank bolts ..... 60 to 70 off
Stud bolts without nuts ..... 60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.
Tire bolts .....60-5 off

Nuts

Semifinished ..... 60 to 70 off

HEXAGON CAP SCREWS

Milled .....80-10-10 off
Upset 1 in. diam. and smaller.....85-5 off

SQUARE HEAD SET SCREWS

Milled .....80-10 off
Upset 1 in. diam. and smaller .....80-10-10 off

RIVETS

Struct., c.l., Pitts.-Cleve..... 2.80c to 2.90c
Structural, c.l., Chicago 3.00c
**7/16-inch and smaller, Pitts.....70 and 10 off
Chi., Cleve. .....70 to 70 and 10 off
**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.....$6.50 to 6.75 off
Wrought, c.l., Chicago dist.....$6.70 to 6.90 off
Lock: To dealers .....85-5 off
Lock: To consumers .....85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth .....$33.00 to 34.00
Pittsburgh, bessemer ..... 33.00 to 34.00
Youngstown ..... 33.00 to 34.00
Cleveland 33.00
Philadelphia ..... 33.30 to 39.30
Chicago 33.00
Forging, Chicago 38.00
Forging, Pittsburgh 38.00
Forging, Philadelphia 43.30

SHEET BARS

Pittsburgh $33.00
Youngstown 33.00
Cleveland 33.00
Chicago 34.00

SLABS

Pitts., Young., and Cleve.....$33.00 to 34.00

WIRE RODS

Pittsburgh, Cleveland $42.00
Chicago 43.00

SKELP

All grades, Pittsburgh ..... 1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½% $4.55
Mesabi bessemer, 51½% 4.40
Old range nonbessemer 51½% 4.25
Mesabi nonbessemer, 51½%..... 4.25

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% 8.00
Copper free low phosphorus 58 to 65 per cent ..... nominal

FOREIGN ORE
Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese.. 10.50 to 11.00
North African low phosphorus 10.00 to 11.00
Swedish foundry or basic, 65% 9.00 to 9.50
Spanish and North African basic, 50 to 60 per cent ..... 8.50 to 9.00
Newfoundland foundry, 55%.... 8.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian ..... 36 to 38 cents
Indian ..... 35 to 38 cents
Caucasian (53-55 per cent) .... 38 to 40 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton....$17.00 to 18.00
Washed gravel, imported duty paid, east, tidewater, net ton $16.00

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works
First Quality

Pennsylvania .....$43.00 to 46.00
Ohio ..... 43.00 to 46.00
Illinois ..... 43.00 to 46.00
Kentucky ..... 43.00 to 46.00
Missouri ..... 43.00 to 46.00
Maryland ..... 43.00 to 46.00
Georgia and Alabama ..... 40.00 to 45.00

Second Quality

Pennsylvania ..... 35.00 to 38.00
Ohio ..... 35.00 to 38.00
Illinois ..... 35.00 to 38.00
Kentucky ..... 35.00 to 38.00
Missouri ..... 35.00 to 38.00
Maryland ..... 35.00 to 38.00
Georgia and Alabama ..... 30.00 to 35.00

SILICA BRICK

Pennsylvania 43.00
Joliet, Ill., East Chicago, Ind.... 52.00
Birmingham ..... 50.00 to 51.00

MAGNESITE BRICK
Per Net Ton

9 x 4½ x 2½ 65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base
Dead-burned grain magnesite.... 40.00

CHROME BRICK

Net Ton Chester, Pa., and Baltimore base
9 x 4½ x 2½ 45.00

Pig Iron

Market Again Advances at Chicago, Detroit and Buffalo—Valley Prices Stronger—More Than 40,000 Tons of Basic on Inquiry

PRICE strength continues to assert itself in the pig iron market. Further advances have been made at Chicago, Detroit and Buffalo, and on some grades, notably malleable, basic and bessemer in the valley. The market generally in these districts is about $2 higher today than in September. Furnace stocks are lower than at any prior time this year, with shipments continuing at the highest rate of the year. October shipments in the aggregate exceeded those of September. Spot demand is active and consumers are covering for first quarter. Sales by furnace interests at Cleveland in the past week amounted to 42,000 tons, at St. Louis 18,000 ton, and New York 15,000 tons. Inquiries for basic iron from several northern Ohio consumers call for a total of 45,000 tons.

PITTSBURGH, Oct. 30.—Pig iron prices are more firmly established at the higher levels announced some time ago. Following a period of inactivity in basic iron, due to scarcity of this grade, some small sales have been made at $17.50, valley. It is understood a northern Ohio steel foundry paid this figure in closing on part of its recent inquiry. A continued lack of basic holds this grade in a strong position. Bessemer continues strong, with sales at $18, valley. The bessemer situation is less acute than basic in regard to supplies. No sales of bessemer are heard above $18, but lower prices have disappeared. Spot demand for foundry iron is steady, with some melters more active in taking contract shipments. One interest reports sales in the past week amounting to 2000 tons of No. 2 foundry, all at $17.50, valley, at which level the market is held firmly. Sales of malleable are light. Some purchases are noted at $18, valley, but iron is available at a lower figure.

Boston, Oct. 30.—Pig iron sales in this district in the past week totaled 6000 tons. Buffalo No. 2 plain is quoted at $22.41 and No. 2X at $22.91, delivered, while Virginia iron brings $26.91 for No. 2 plain and $27.41 for No. 2X. A Springfield, Mass., foundry is in the market for 1800 tons. Local foundries are now operating at about 75 per cent.

New York, Oct. 30.—Active buying features the pig iron market, and prices paid show an advance of 50 cents a ton. Buffalo makers have put up their prices to $17.50 to $18, base, Buffalo, and $18 is minimum for first quarter. Sales here during the past week aggregated 15,000 tons. A fair portion involves malleable iron, selling at 50 cents a ton higher than foundry. New inquiries aggregate about 15,000 tons, of which about half are from important consumers who are asking prices for first quarter. A moderate quantity of English low phosphorus iron has been sold at $22.50, duty paid, tidewater. The supply of Indian foundry iron for this year practically has been sold. No offers of Dutch foundry iron are being made at this time because of a contemplated ocean freight rate advance.

Buffalo, Oct. 30.—Principal pig iron producers here announce a further advance to $18.50, Buffalo, on foundry and $19 on malleable for fourth and first quarter for local delivery. Shading on outside tonnage would not exceed 50 cents, under any conditions, it is stated. Some of the largest sellers are nearly sold up for this quarter. The price advance has checked buying. Three inquiries for 1000 to 2500 tons had not been covered when the increases were announced.

Cleveland, Oct. 30.—October shipments of pig iron by furnace interests representative in Cleveland exceeded September. Shipping instructions for November indicate a continuation of the high rate. Sales are active, representing spot orders for filling-in purposes, and contracts for first quarter. The aggregate in the past week was 42,000 tons, compared with 38,300 tons in the week preceding, and 26,800 tons in the week before that. All companies are booking business for first quarter. Cleveland prices are steady at $18, base, furnace, for outside shipment and $18.50, base, furnace for shipment in the local 50-cent switching area. The market in western Ohio, Indiana and lower Michigan also is steady. Another advance of 50 cents is noted in the Buffalo market, leading sellers now holding to $18.50, base, furnace, for foundry iron and $19 for malleable, for all deliveries.

Inquiries for basic have climbed to a total of nearly 45,000 tons. Central Alloy Steel Corp. wants 25,000 tons and Timken Roller Bearing Co. 10,000 tons. American Steel Foundries' inquiry for 3000 to 5000 tons is reported still pending while a central Ohio steel foundry is in the market for 1000 tons. A pig iron producer seeking 5000 tons for one of its related companies is understood to have offered $17.50, valley, without obtaining the desired tonnage.

Detroit, Oct. 30.—Foundry and malleable iron have advanced another 50 cents per ton. The price now is $19, lake furnace, with full silicon differentials obtained. This price has been fully substantiated by several sales of 400 to 500 tons at a time and at least two involving 1000 tons at a time. Casting makers for the automotive industry are thriving on the sustained and apparently expanding demand. Malleable iron activity is given further impetus by additional supplanting of drop forgings on a popular priced model. Foundries which will supply castings for the new 6-cylinder Chevrolet are preparing to furnish castings on a production basis by the forepart of November, and already are releasing November-December pig iron orders.

Cincinnati, Oct. 30.—The pig iron market is quiet, with few inquiries noted. One firm reports a sale of 1000 tons in Indiana, and about 1500 tons in small lots elsewhere. Fifty tons of southern iron was taken by a Louisville concern Monday. Price

(*Concluded on Page* 1151)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$18.00 to 18.50
Bessemer, del. Pittsburgh	19.76 to 20.26
Basic, valley furnace	17.50
Basic, del. Pittsburgh	19.26
Basic, Buffalo furnace	17.50
Basic, del. eastern Pa.	19.75 to 20.00
Malleable, valley furnace	17.50 to 18.00
Malleable, del. Pittsburgh	19.26 to 19.76
Malleable, del. Cleveland	19.00
Malleable, Chicago furnace	19.50
Malleable, Buffalo furnace	19.00
Malleable, del. eastern Pa.	21.00 to 21.28
No. 1 foundry, Chicago furnace	20.00
No. 1X, eastern del., Phila.	21.76 to 22.26
No. 1X, Buffalo furnace	20.00
No. 2 foundry, valley furnace	17.00 to 17.50
No. 2 foundry, del. Pittsburgh	18.76 to 19.26
No. 2 plain, Buffalo furnace	18.50
No. 2 foundry, Chicago furnace	19.50
No. 2 foundry, Granite City	19.50 to 20.00
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	19.00
No. 2 plain, del., Phila.	20.76 to 21.26
No. 2 plain, Virginia furnace	20.00
No. 2 plain, N. J., tidewater	20.01 to 21.28
No. 2 Alabama, Birmingham	16.25
No. 2 Alabama, del. Cincinnati	19.94
No. 2 Tenn., Birmingham base	16.25
No. 2 Tenn., del. Cincinnati	19.94
No. 2 Alabama, del. Chicago	22.26
No. 2 Alabama, del. Cleveland	22.51
No. 2 Alabama, del. St. Louis	20.67
No. 2X, east, N. J., tidewater	21.28 to 21.78
No. 2X, eastern, del. Phila.	21.26 to 21.76
No. 2X, foundry, Buffalo furnace	19.00
No. 2X, eastern, del. Boston	20.91 to 21.41
No. 2X, Virginia furnace	20.50
Gray forge, val., del. Pittsburgh	18.26 to 18.76
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.26 to 24.76
Low phos, copper bearing fur.	23.00
Charcoal, Birmingham	28.00
Charcoal, Superior, del., Chicago	27.04
CANADIAN PRICES	
No. 2 foundry, del. Toronto	23.60
No. 2 foundry, del. Montreal	25.00
Malleable, del. Toronto	23.60
Malleable, del. Montreal	25.00
Basic, del. Montreal	24.00

Silvery iron, Jackson county (Ohio) furnace in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Coke

Market Is Strong, and Demand Active—Beehive Output Down to Contract Requirements

COKE prices are stronger than in many weeks, and a scarcity in some districts is evident by inquiries coming to certain producers. Consumers and middle interests are doing considerable "shopping around," Spot beehive furnace coke is selling at $2.85 to $2.90. Bethlehem Steel Corp. is reported to have contracted for 25,000 tons to the end of the year.

Pittsburgh, Oct. 30.—Strength of the beehive coke market is maintained by general absence of offerings and steady movement on contracts. Output of some interests is sufficient only to fill contracts. Sellers generally are able to command $2.90 in the spot market for furnace fuel, with $2.85 applied only in a few instances. Higher prices are not well established. It is understood the Bethlehem Steel Corp. contracted for 25,000 tons of coke for shipment through the remainder of the year. Foundry coke demand is slightly more active, in line with improved operations. prices, however, hold to the previous range of $3.75 to $4.85.

Production of coke in the Connellsville region for the week ended Oct. 20 was 62,850 tons, against 53,970 tons the preceding week, according to the *Connellsville Courier*.

Boston, Oct. 30.—Foundries continue to seek coke supplies, as a result of the increase in the melt. There is no indication there will be any price change for November.

New York, Oct. 30.—Demand for foundry coke here continues exceedingly good, and shipments are heavy. For Connellsville foundry some operators ask as much as $4.25 and $4.50, Connellsville, for prompt shipment. This coke also is obtainable at $3.75 to $4. Latrobe foundry coke continues $4.85, Latrobe. By-product foundry coke is $9 to $9.40, delivered at Newark, N. J., and $11, delivered at representative New England consuming points.

Detroit, Oct. 30.—Intermittent buying of by-product foundry coke from nearby ovens, continues at $8.50, ovens ($9 delivered in Detroit). Specifications during the past few days have slackened as far as steel casting foundries are concerned but on the other hand malleable and gray iron foundries have increased their shipping instructions. Most foundries order their coke so as to unload direct from car to cupola. They do not put it into stock.

Cincinnati, Oct. 30.—Foundry coke is moving in good volume. Foundry and furnace coke prices will continue unchanged for November.

Chicago, Oct. 30.—Shipments of by-product foundry coke in October exceeded September. All ovens are lighted. Prices are steady at $8, ovens, and $8.75 for local delivery.

St. Louis, Oct. 30.—The movement of metallurgical coke is large. The total for October will run well ahead of September. Stove and jobbing foundries have stepped up their operations, and generally the melt is large. By-product ovens are operating at capacity, and shipping close to their entire output. Prices are steady.

Birmingham, Ala., Oct. 30.—Slight improvement again is noted in the coke market. About 3000 tons is being moved to the far West. The shipment will be by rail to the gulf and then by water. Prices are steady.

Coke Prices

Prices per Net Ton	
Beehive Ovens	
Connellsville furnace	$2.90 to 3.00
Connellsville foundry	3.75 to 4.85
New River foundry	6.50 to 7.00
New River furnace	6.50
Wise county foundry	4.50 to 5.25
Wise county furnace	3.75 to 4.25
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham	5.00
Indianapolis, del.	8.25
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	8.50
Buffalo, ovens	9.00

Ferroalloys

Contracts Signed for Entire Year, But Action Is Slow

Pittsburgh, Oct. 30.—Ferromanganese consumers are slow to sign up for 1929, although most sellers have opened books at the unchanged price of $109.79, delivered, Pittsburgh. Next year's contracts are being signed for the entire year. Contract prices for special ferroalloys next year are unchanged except for a reduction of 1 cent a pound in low carbon ferrochrome. Specifications continue at the active rate of the past few months, and total tonnage of ferromanganese this year gives indications of being a record. Spiegeleisen demand also is heavy, with sales for prompt shipment at $33, furnace, for 19 to 21 per cent. Most sellers of fluorspar are well booked with several quoting $18, mines.

New York, Oct. 30.—A number of large consumers already have closed their 1929 ferromanganese requirements at $105, duty paid, tidewater, which all sellers are quoting for 1929. In the meantime, heavy specifications continue to be received against second half of 1928 contracts.

Special ferroalloys are strong. Contract prices are unchanged and contracts for 1929 are being signed rapidly. These statements apply especially to silicon, chrome, and vanadium alloys. The exception in prices is the cut of 1 cent in low-carbon ferrochrome. Tungsten ore is strong, wolframite being $11 a short ton unit duty paid, and scheelite $11.50.

Valley Operations Hold at 80 Per Cent

Youngstown, O., Oct. 30.—Steelworks operations in this district continue unchanged at around 85 per cent. Due only to necessity of making imperative repairs to open hearths, steel ingot production is slightly lower this week but finishing mills are keeping up their pace practically. Forty-nine of the 51 available independent open hearths are active, and the Carnegie Steel Co. holds to its unchanged 80 per cent production program.

Bar mill operations with independents is at 70 per cent, against Carnegie Steel's 80 per cent. Tin plate production with the independents is almost at 100 per cent, where strip output still continues, while Steel corporation tin mill subsidiary units are at 75 per cent.

Out of 127 independent sheet units, 112 are active this week, a loss of one from last week and of three from two weeks ago. Wrought pipe mill activities with the independents include 15 seamless and welded units active out of 20. The Girard, O., puddling mill is 60 per cent active, with its skelp departments at 85 per cent.

The word "iron" originally came from the old Teutonic language group and was represented in the early branches of that group by such terms as iren, yren, isen, isarn, eisern and jern.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace	33.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	88.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	96.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

*These prices contract, spot $5 higher.

Scrap

Strength Continues Feature—Prices Holding Firmly and Some Advances Being Made

WHILE actual shortage has not developed in iron and steel scrap, and users continue to obtain sufficient for their needs, dealers with orders find difficulty in obtaining tonnage and are taking losses. Prices are strong and advances are being made on various grades. Steel grades are close to pig iron prices.

Chicago, Oct. 30.—Heavy melting steel is strong at $14 to $14.50, f.o.b. Chicago switching district, while sellers who have been accumulating material, are holding for $15. The scrap market is strong throughout, but only a few grades advanced during the week. Actual shortages are shown in scrap for electric furnace use and in a few other grades. A sale of cast borings is reported closed at $12, the highest for this material in months. Twenty-four cars of heavy melting steel came into this market with the closing of the St. Paul railroad list. This was sold to dealers at $15.25, delivered.

Boston, Oct. 30.—Following the advance of heavy melting steel in the past fortnight, there has been a generally firmer price for all scrap. Stove plate is less in demand than for a month, resulting from Bridgeport makers being about supplied for the time being.

Pittsburgh, Oct. 30.—A slightly easier tone exists in iron and steel scrap as the result of failure of some anticipated mill buying to materialize, although prices have not been affected to a marked degree. Consumers and

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$10.00 to 10.75
Boston, dealers	11.50 to 12.00
Boston No. 2	10.00 to 10.50
Buffalo, No. 1	16.00 to 17.00
Buffalo, No. 2	13.50 to 14.00
Chicago	14.00 to 14.50
Cincinnati, deal	13.75 to 14.25
Cleveland, No. 1	14.50 to 15.00
Cleveland, No. 2	14.00 to 14.50
Detroit, No. 1	13.75 to 14.25
Detroit, No. 2	11.00 to 11.50
Eastern Pa.	15.00 to 16.00
Eastern Pa. No. 2	12.50 to 13.50
N. Y., deal., R. R.	12.00 to 12.50
N. Y., deal., yd	9.00 to 9.50
Pittsburgh, No. 1	17.50 to 18.00
St. Louis, No. 1	13.25 to 13.75
St. Louis, No. 2	12.50 to 13.00
Valleys, No. 1	16.50 to 17.00

COMPRESSED SHEETS

Buffalo	15.00 to 15.50
Chicago	12.50 to 13.00
Cleveland	14.00 to 14.50
Detroit	13.50 to 14.00
Pittsburgh	17.50 to 18.00
Valleys	16.00 to 16.50
E. Pa. new mat	13.00 to 13.50

BUNDLED SHEETS

Buffalo	11.50 to 12.00
Cincinnati, deal	10.50 to 11.00
Cleveland	12.25 to 12.75
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.25 to 14.75
St. Louis	8.50 to 9.00

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Cincinnati	10.00 to 10.50
Detroit	8.50 to 9.00
St. Louis	8.50 to 9.00

STEEL RAILS, SHORT

Birmingham	10.50 to 11.00
Boston	8.25 to 8.75
Buffalo	17.00 to 18.00
Chicago	16.75 to 17.25
Cincinnati, deal	19.00 to 19.50
Detroit	17.00 to 17.50
St. Louis	17.50 to 18.00

STOVE PLATE

Birmingham	13.00 to 13.50
Boston consumers	11.00 to 11.50
Buffalo	14.50 to 15.00
Chicago, net	11.50 to 12.00
Cinn., deal., net	9.50 to 10.00
Cleveland	10.00 to 11.00
Detroit, net	10.75 to 11.00
Eastern Pa.	12.50 to 13.00
N. Y., deal., mill	8.75 to 9.25
Pittsburgh	11.50 to 12.00
St. Louis	12.00 to 13.00

SHOVELING STEEL

Chicago	14.00 to 14.50
Pittsburgh	12.50 to 13.00
St. Louis	13.25 to 13.75

KNUCKLES, COUPLERS SPRINGS

Buffalo	16.00 to 18.00
Chicago	16.25 to 16.75
Eastern Pa.	17.00 to 17.50
Pittsburgh	19.00 to 19.50
St. Louis	14.50 to 15.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	21.00 to 21.50
Cincinnati, deal	15.00 to 15.50
Eastern Pa.	17.50 to 18.50
Pitts. billet and bloom crops	21.00 to 21.50
Cleve. billet and bloom crops	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	15.50 to 16.00
St. Louis	14.50 to 15.00

ANGLE BARS—STEEL

Buffalo	14.00 to 14.50
Chicago	16.00 to 16.50
St. Louis	14.00 to 14.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	11.50 to 12.00
Buffalo, No. 1	12.00 to 12.50
Buffalo, No. 2	15.50 to 16.00
Chicago, No. 1	13.70 to 14.30
Chicago, No. 2	14.00 to 14.50
Cinn., No. 2	13.75 to 14.25
Eastern Pa.	15.00 to 16.00
N. Y., No. 1 deal.	11.50 to 12.00
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	17.50 to 18.00
St. Louis, No. 1	12.00 to 12.50
St. Louis, No. 2	13.25 to 13.75

WROUGHT PIPE

Boston, dealers	10.00 to 10.50
Eastern Pa.	15.00
Buffalo	12.00 to 12.50
New York, deal	10.75 to 11.25

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pa.	15.00 to 15.50

BUSHELING

Buffalo	14.00 to 15.00
Chicago, No. 1	12.00 to 12.50
Chicago, No. 2	8.50 to 9.00
Cinn., No. 1 deal.	11.00 to 11.50
Cinn., No. 2	7.00 to 7.50
Cleveland, No. 2	11.00 to 11.50
Detroit, No. 1	12.50 to 12.75
Detroit, mixed	7.50 to 8.00
Pittsburgh, No. 1	14.50 to 15.00
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	7.00 to 7.50
Buffalo	7.50 to 8.50
Chicago	7.50 to 8.00
Cincinnati, deal	9.25 to 9.75
Cleveland	9.50 to 10.00
Detroit	8.75 to 9.00
Eastern Pa.	11.50 to 12.00
New York, deal	8.00 to 8.50
Pittsburgh	11.25 to 11.75
St. Louis	7.00 to 7.50

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	6.25 to 6.50
Buffalo	11.00 to 11.50
Cincinnati, deal	10.00 to 10.50
Cleveland	11.00 to 11.50
Detroit	9.00 to 9.25
Eastern Pa.	10.50 to 11.00
New York, deal	7.25 to 7.75
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 9.00
Boston, chem.	10.00 to 10.25
Boston, dealers	6.25 to 6.50
Buffalo	11.00 to 11.50
Chicago	11.50 to 12.00
Cincinnati, deal	10.00 to 10.50
Cleveland	11.00 to 11.50
Detroit	9.00 to 9.25
Eastern Pa.	11.00 to 11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal	7.25 to 7.75
Pittsburgh	12.50 to 13.00
St. Louis	10.00 to 10.50
Valleys	12.50 to 13.00

PIPE AND FLUES

Chicago, net	8.50 to 9.00
Cincinnati, deal	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago, net	12.25 to 12.75
Cincinnati	10.00 to 10.50
Eastern Pa.	12.50 to 13.00
New York, deal	9.25 to 9.75
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston, dealers	8.50 to 9.00
Buffalo	12.00 to 12.50
Chicago	9.00 to 9.50
Cleve., over 10 in.	12.25 to 12.75
Detroit	11.50 to 12.00
Pittsburgh (light)	14.00 to 14.50

FORGE SCRAP

Boston, dealers	7.00 to 7.50
Chicago	16.50 to 17.00
Eastern Pa.	12.00 to 13.00

ARCH BARS AND TRANSOMS

Chicago, net	20.50 to 21.00
St. Louis	19.50 to 20.00

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.75 to 7.00
Buffalo	12.00 to 12.50
Chicago	11.50 to 12.00
Cleveland	12.50 to 13.00
Eastern Pa.	12.00 to 13.00
Pittsburgh	15.00 to 15.50
St. Louis	9.50 to 10.00

STEEL CAR AXLES

Birmingham	16.00 to 16.50
Boston, ship point	16.00 to 16.50
Buffalo	17.75 to 18.25
Chicago	17.90 to 18.50
Cleveland	19.50 to 20.00
Eastern Pa.	22.00
Pittsburgh	20.50 to 21.00
St. Louis	18.75 to 19.25

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	17.35 to 17.90
Eastern Pa.	20.00 to 21.00
New York, deal	15.00 to 16.00
St. Louis	17.50 to 18.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 12.50
Boston, con.	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	16.50 to 17.00
Chicago, iron	13.50 to 14.00
Chi., rolled steel	17.50 to 18.00
Cincinnati	12.50 to 13.00
Eastern Pa., cast	16.50 to 17.00
Eastern Pa. rolled	17.00 to 17.50
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	19.50 to 20.00
St. Louis, iron	14.00 to 14.25
St. Louis steel	15.75 to 16.25

No. 1 CAST SCRAP

Birmingham, cup.	14.00 to 14.50
Buffalo	15.50 to 16.00
Boston, textile	15.50 to 16.00
Chicago, mach.	16.80 to 17.35
Chicago, railroad	16.25 to 16.80
Chicago, agri.	15.40 to 15.95
Cincinnati, mach. cupalos, net deal.	16.00 to 16.50
Cleveland, cupola	16.50 to 17.00
Detroit, net	13.50 to 14.00
Eastern Pa. cupola	16.50 to 17.50
N. Y., cup., deal.	13.00 to 13.50
Pittsburgh, cupola	15.25 to 15.75
San Fran., del.	13.50 to 14.00
Seattle	15.50 to 15.75
St. Louis	13.00 to 13.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	12.50 to 13.00
Cleve., breakable	12.50 to 12.75
Detroit, auto., net	19.00 to 19.50
Detroit, breakable	9.00 to 9.50
Eastern Pa.	16.50 to 17.00
New York, deal	12.50 to 13.00
Pittsburgh	14.00 to 14.50

MALLEABLE

Boston, railroad	15.00 to 15.50
Buffalo	15.50 to 16.00
Chicago, agri.	13.00 to 13.50
Chicago, railroad	15.50 to 16.00
Cinn., R. R., deal.	14.50 to 15.00
Cinn., agri., deal.	13.50 to 14.00
Cleveland, agri.	15.00 to 15.50
Cleveland, rail.	16.00 to 16.50
Detroit, auto	14.50 to 15.00
Pittsburgh, rail	14.00 to 14.25
St. Louis, rail	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	11.00 to 11.50
Boston, dealers	11.50 to 12.00
Rails scrap, Boston	10.50 to 11.50
Skeleton, Boston	9.00 to 9.50
Buffalo	15.00 to 15.50
Chicago	16.50 to 17.00
Eastern Pa.	14.50 to 15.00
New York	11.50 to 12.00
Pittsburgh district	18.00 to 18.50
St. Louis	15.00 to 15.50

LOCOMOTIVE TIRES

Chicago, No. 1	14.50 to 15.00
Chicago, cut	16.50 to 17.00
St. Louis, No. 1	13.00 to 13.25

LOW PHOS. PUNCHINGS

Chicago	16.00 to 16.50
Pittsburgh	18.50 to 19.00

dealers are marking time. One dealer reports an offer of $18 for heavy melting steel, but the situation here is not so strong as in the Youngstown district, where this grade recently brought the equivalent of $18.50, Pittsburgh. The Pennsylvania railroad is taking bids until Nov. 1 on 44,070 tons assorted grades, including such items as 10,150 tons of heavy melting steel, 7270 tons rails and 5750 tons unsorted steel car and locomotive tender material.

New York, Oct. 30.—Fresh consuming demand for iron and steel scrap is light but tonnage is moving against contracts. Except some cast grades supplies are coming freely. Dealers' buying prices are unchanged, with the tendency easier.

Philadelphia, Oct. 30.—An easier tone in iron and steel scrap is not reflected in prices but in freer offerings. Consumers report they are being deluged with offers. Actual business is small.

Buffalo, Oct. 30.—There have been no new sales of heavy melting steel but dealers say the market is sentimentally stronger. Deliveries are heavy and dealers are having considerable difficulty in making full scheduled deliveries. Some upward price revisions have been made with sales of specialties.

Youngstown, O., Oct. 30.—A large local dealer is understood to have bid $18 per gross ton on 5000 tons of heavy melting steel offered by a railroad for delivery here over the remainder of the year. The scrap situation is strong, owing to continued high operation of the mills and limited supply of scrap.

Cleveland, Oct. 30.—Scrap continues strong. While local mills still refuse to place fresh orders, activity by dealers on their old orders continues a feature. Dealer buying of this nature continues to support the higher prices. No. 1 heavy melting steel again advances 25 cents; several other grades go up 50 cents. Blast furnace material is particularly strong. Automobile lists are coming out, along with railroads' November offerings. Buick closed on 132 carloads and Dodge is offering close to 4500 tons.

Detroit, Oct. 30.—After a feverish week when, through the force and extent of dealer activity, the scrap market reached the top figure of $14.50 for No. 1 heavy melting steel, quotations have settled to a more stabilized position. Sales latterly have been made at $18 in the Mahoning valley and at $18.25 at Pittsburgh, which prices, less $4, gives the true state of the market here at the moment, $14 to $14.25, with other grades in harmony therewith. On No. 2, however, the usual $1 differential has been abandoned, nothing higher than $11.50 having applied recently. Cast iron borings have brought as high as $9.25 and machine shop turnings now have a top of $9. The first November scrap list from automobile companies is from Chrysler. Bids on these will approximate the October levels. Scarcity of scrap has been augumented by inactivity at Chevrolet plants and partially explains the market's strong position.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	7.50

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.50
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	13.00
Stove plate (net)	9.00

Cincinnati, Oct. 30.—Some rail lists supplemental to the regular October offerings and also initial November offerings in iron and steel scrap close this week. A general advance in prices has been effected in anticipation of a heavy advance in bids on these offerings. A number of advances of 25 cents to 50 cents per ton have been made.

St. Louis, Oct. 30.—Iron and steel scrap has increased the strength of its position in this district. Consumers are in need of material, and good quantities have changed hands, but in few instances have all requirements been filled, due to scarcity and unwillingness of dealers to accept prices offered.

Railroad lists are of large size, but the material has been absorbed further east in the case of eastern roads, and in states west and south in the case of southwestern lines. Aside from the railroads, sources are narrow, the movement from the country being negative.

Birmingham, Ala., Oct. 30—Though no change in iron and steel scrap is apparent, a better feeling undoubtedly exists. Eleven active open-hearth furnaces will be increased by four or five this week. In addition to heavy melting steel, there is need for No. 1 cast and stove plate.

Toronto, Ont., Oct. 30.—While strong demand features iron and steel scrap, large tonnage orders are limited. Small lot buying is active and totals for the week compare favorably with other high average weeks which this year has had.

The American Bridge Co. has three barges out of an order of nine for the Union Barge Line Corp. on its Ambridge, Pa., ways. It is expected to start work on the order of 30 steel barges for the Mississippi river commission this week.

Semifinished

Shipments Continue at High Level—Market Strong—Valley Operations Near 90 Per Cent

SHIPMENTS of semifinished steel in October were close to those of September, a slight decrease being reported in some districts, while in others an increase was noted. Specifications continue at a high rate. Valley production is close to 90 per cent. While spot sales of billets and slabs are being made at $34, base, Pittsburgh, shipments are being made on contracts at $33.

SEMIFINISHED STEEL PRICES, PAGE 1136

Pittsburgh, Oct. 30.—The movement of billets, slabs and sheet bars continues heavy. Specifications reflect high activity of sheet and strip producers, and although the total October tonnage is expected to show a slight decrease from September, the volume is seasonally high. On spot business producers quote $34, Pittsburgh, for 4 x 4-inch rerolling billets and slabs, although specifications are being applied against lower price contracts. Sheet bars are firm at $33 with wire rods at $42.

Philadelphia, Oct. 30.—Substantial tonnages of rerolling and forging billets were sold in the past week at $33 and $34, base, Pittsburgh, for the former, and $38, Pittsburgh, for forging stock.

Youngstown, O., Oct. 30.—An acute shortage of wire rods impends in eastern and northern Ohio. Wire rods are going into so many other trades than wire drawing that a scarcity has developed that promises under present conditions to become painful to some users within the next 30 days. Billet and sheet bar sales continue largely routine, with local mills endeavoring merely to satisfy the needs of old customers. Sheet bars hold here at $33, Pittsburgh and Youngstown, with large billets at $34, and wire rods at $42, Cleveland and Pittsburgh.

Chicago, Oct. 30.—Specifications for all semifinished steel material are good. Prices are unchanged, with rerolling billets, 4 x 4-inch base, $33, Chicago, and forging billets $38, base. Sheet bars are $34 and wire rods $43, Chicago, or $42, Pittsburgh-Cleveland.

The sectional committee on the standardization of shafting of the American Society of Mechanical Engineers will hold a meeting at the society's headquarters Oct. 31, to consider the revision of certain standards which were developed by this committee some time previous.

Bars

Pressure on Mills Relaxes Though Deliveries Still Lag—Large Tonnage Moving—Forgers Are Busy

BUYING of soft steel bars continues the most active feature of finished steel, though the total tonnage is somewhat less than a fortnight ago. Deliveries now are somewhat in excess of new buying, though immediate delivery cannot be obtained. Prices are steady and show no weakness. Production is seasonally high and all classes of users are consuming at a high rate.

BAR PRICES, PAGE 1135

Chicago, Oct. 30.—While indications are that a maximum autumn buying movement in some of the heavier finished steel products was passed early in October, sales of bar and other lighter rolled products show that no slack has appeared. Mills report the week just closed one of the heaviest of the year in specifications. Sales, while less than in early October, are close to the average of the year. Forgers are heavy users, particularly those serving the automotive trade, heavy machinery and dredge manufacturers. Those automotive buyers who prepare programs 30 days ahead give indication that schedules will show less decline in November than had been expected. Farm implement demand still is high. Bar deliveries still are tight in some sizes, extending as far as 30 days. Soft steel bars are 2.00c to 2.10c, Chicago. One producer has named 2.00c for contract business that develops a certain specified tonnage per quarter. Both Chicago Heights rail steel bar mills are operating at capacity, quoting a minimum of 1.95c, Chicago Heights, to the manufacturing trade. Producers of bar iron now quote 2.10c for spot and contract business. Sales to implement works are moderately active.

New York, Oct. 30.—Demand for steel bars is maintained in heavy volume and bookings in this territory in October equal September business. The current range is 1.90c to 2.00c, base, Pittsburgh, equivalent to 2.24c to 2.34c, delivered New York. The 1.90c price is restricted to the most attractive tonnages.

Pittsburgh, Oct. 30.—Further decline is noted in specifications for hot-rolled bars although this is light when the heavy September tonnage is considered. Backlogs are being decreased, however, and mills have been able to improve shipments. Buyers requesting immediate delivery still experience delay. Although total October tonnage was below that of September, it was seasonally high. Spot business is light but mills are asking 2.00c, Pittsburgh, with specifications being applied against lower priced contracts.

Cleveland, Oct. 30.—Outside mills selling merchant steel bars here quote a minimum of 1.95c, Cleveland. They have much business on their books at 1.90c, Pittsburgh, but claim that all recent business has been booked at 1.95c, Pittsburgh. Orders are noted from nut and bolt manufacturers, cold bar finishers and other consumers directly or indirectly connected with the automotive trade.

Philadelphia, Oct. 30.—Steel bar demand is somewhat lighter. Prices continue 1.90c to 2.00c, base, Pittsburgh. Mills shipping into this territory are so well scheduled they need specifications four to six weeks ahead.

Detroit, Oct. 30.—Merchant steel bar tonnage still is of large proportions for miscellaneous purposes. Most sales are at 1.95c, Pittsburgh, with large tonnage buyers enjoying a 1.90c, figure. Few sales bring 2.00c. The Cleveland base prices do not largely apply here, although sellers encounter them at times in the western part of Michigan

Alloy Aggregate High

Detroit, Oct. 30.—While specifications for alloy bars during the past week have tapered off slightly, the aggregate tonnage of both orders and shipments is still relatively high. Several automobile manufacturers and parts makers are increasing their output. A few are about to enter a period of preparation of new models and are lowering theirs. The Chrysler-Dodge interests are making some of the parts of the two cars interchangeable and this is bringing a temporary lull in shipping instructions on some foreign material. Most forge shops, however, continue to operate full. The open market quotation appears to be fairly firm at $2.75, base f.o.b. mill, although numerous shipments to large users are being made at $2.65. Favorable tonnage would still develop that price. The first quarter price, not as yet announced, will in all probability be a minimum of $2.75 makers say.

Plates

Market Is Quieter—10,000 Tons Placed at Chicago for Oil Country—Barge Builders Active

DEMAND for plates is moderating, and mill backlogs are less impressive. Oil country and railroad requirements promise large additional orders in the near future. Chicago mills booked approximately 10,000 tons of plates for oil producers in the past week, and received new inquiries for 5500 tons. Quantity orders from the oil country take a differential under 2.00c, Chicago.

PLATE PRICES, PAGE 1135

Chicago, Oct. 30.—A Chicago district mill has booked 5500 tons of oil tank plates for refinery work in the Southwest. About 5000 to 5500 tons have come out in new inquiry in the same territory. In addition, a fabricator has taken 4000 tons for Roxana Petroleum Co. Backlogs of heavier plates for miscellaneous manufacturing lines have dwindled slightly, but recent tonnage from the oil country and prospects for railroad equipment business soon indicate stronger schedules for heavier plate mills. Plate mill operations are close to 80 per cent. Quantity orders from the oil country have been at a differential under the 2.00c, Chicago, price. The 2.10c quotation for miscellaneous buyers in this territory is being maintained.

New York, Oct. 30.—Demand for plates continues good though not up to the volume of September and early October. About 900 tons of plates is expected to be placed this week by American Locomotive Co. for 20 locomotives booked for Delaware, Lackawanna & Western. The usual price on tank lots continues 2.05c, base, Coatesville, equivalent to 2.225c, delivered New York, while on points to the west 1.90c, base, Pittsburgh is the price. On small lots as high as 2.10c and 2.15c, base, Coatesville, are done.

Alan Wood Iron & Steel Co. has advanced its price on raised pattern floor plates $2 a ton to 3.65c, base, Pittsburgh.

Philadelphia, Oct. 30.—The city has advertised for a pipe line, to involve about 9000 tons of plates. Bids will be opened Nov. 7. The New York Shipbuilding Corp. has booked a combination passenger and freight liner for W. R. Grace & Co., involving about 7000 tons of plates.

Pittsburgh, Oct. 30.—Demand for plates has fallen off more than that for bars, although current buying compares favorably with the August rate, if not with the heavy September tonnage. Tank and pipe line work continue to account for a good volume of plates, while barge builders also are fair specifiers. Mills are

asking 2.00c, Pittsburgh, for spot tonnages with lower prices applied on contract business.

Philadelphia, Oct. 30.—Plate demand continues fair. Considerable tonnage is being taken by railroads for car repairs. Prices are firm at 2.05c, base, Coatesville, and 1.90c, base, Pittsburgh. Prices are shaded in few instances, while small orders bring $1 to $2 higher.

Cleveland, Oct. 30.—Plate specifications are fragmentary in the absence of tankage and ships. Miscellaneous purposes continue to require a fair aggregate. Usual lots are 25 to 100 tons at a time. Some larger specifications are received from boiler and tank shops in Akron, Youngstown, Cincinnati and other Ohio towns. Plates are 1.90c to 1.95c, Pittsburgh, it being possible to obtain the 2.00c price only on rare occasions.

Detroit, Oct. 30.—General plate demand is improving according to several independent steel sellers. Miscellaneous purposes are developing numerous orders for 50 to 250 tons at a time. The 1800 tons for the Detroit river tunnel was awarded with about 2000 tons of structurals to the Commercial Shearing & Stamping Co., Youngstown. Plates are quoted at 1.90c to 2.00c, Pittsburgh, with general orders being taken and specifications filled from day to day at 1.95c.

CONTRACTS PLACED

5500 tons, oil refinery work in Southwest.
4000 tons, refinery work for Roxana Petroleum Co., to United Iron Works.
1800 tons (also 2000 tons structural) segments for Detroit river tunnel to Windsor, Ont., by Canadian Bridge Co., to Commercial Shearing & Stamping Co., Youngstown, O.
750 tons, 15 boilers for pulp mills at Port Townsend and Hoquiam, to Bethlehem Steel Co.; general contract to Puget Sound Machinery depot.
600 tons, 10 locomotive boilers for Great Northern railroad, to Bethlehem Steel Co.; general contract to Puget Sound Machinery depot.
100 tons, ball joints for various users to Pacific Coast Engineering Co., Oakland, Calif.

CONTRACTS PENDING

5000 to 5500 tons for refinery and storage tank work in Southwest.
3600 tons, two car ferries, Pere Marquette railroad, Detroit. Manitowoc Shipbuilding Co., Manitowoc, Wis., reported to be low.
231 tons, 24-inch riveted pipe, Seattle; bids received.
185 tons, 20-inch shore pipe, United States engineer office, San Francisco. Bids Oct. 30.

Buffalo Still at 90

Buffalo, Oct. 30.—Steelworks operations exceed 90 per cent. Bethlehem Steel Co. has every mill on double turn and is operating 22 open hearths. Donner Steel Co. has its open-hearth operations also as near capacity as possible, while sheetmakers are operating at fully 90 per cent. There is no sign of early reduction of such operations.

In 1855 the manufacture of nickel steel on a commercial basis was begun in France.

Pipe

French Makers' Bid Low—Much Cast Pipe Up in East—More Line Pipe Placed

FRENCH makers underbid domestic pipe manufacturers by $7 per ton on 13,920 tons for Warwick, R. I. Approximately 72,000 tons of cast pipe are pending in the East. Several small lots were awarded in California. Disappearing backlogs of line pipe business partially augmented by large orders placed with Spang, Chalfant, Youngstown Sheet & Tube and National Tube companies.

PIPE PRICES, PAGE 1136

New York, Oct. 30.—Herbert Kennedy Co., representing French makers, was low bidder on the 13,920 tons of 6 to 20-inch cast pipe for Warwick, R. I. Its bid was approximately $7 under the lowest domestic bid. Contract is still pending and not placed as reported in last week's issue. Herbert Kennedy Co. bid $36.37, delivered, on the 6 and 8-inch sizes, $36.07 on the 10 and 12-inch sizes, $35.46 on the 16-inch size and $35.04 on the 20, 24 and 30-inch sizes. The lowest domestic bidders were Allen & Reid, representing the Warren Foundry & Pipe Co. They bid $43.50 a ton on the entire lot, with the United States Cast Iron Pipe & Foundry Co. next with $43.70 and R. D. Wood & Co. third, with $44.

Considerable interest is being manifested in the placing of 6100 tons of miscellaneous sizes for Herkimer, N. Y., on which the United States Cast Iron Pipe & Foundry Co., was low for centrifugally cast pipe with a bid of approximately $193,000. Wood bid $223,000 for centrifugal, and Herbert Kennedy Co., representing French makers, bid $235,000 on sand cast pipe. No action on this or the Warwick, R. I., jobs is expected until after election.

Pittsburgh, Oct. 30.—Additional line pipe tonnage placed recently serves to increase backlogs reduced by steady operations of mills. It is understood that between 70 and 80 miles of 10-inch pipe on the Roxana Petroleum Co.'s 450-mile line pipe remains still to be placed. The Youngstown Sheet & Tube Co. received 345,000 tons and the National Tube Co. was awarded the remainder. Spang, Chalfant & Co. have booked 7200 tons of 12-inch pipe for a gas line for the Arkansas Natural Gas Co., and 7220 tons of 10-inch pipe for a gas line for the Empire Oil & Refining Co. Several other line jobs still are pending. General merchant pipe demand is well mtaintained, with seamless oil country goods more active than welded pipe. October pipe tonnage generally compared favorably with September. Drilling operations in the lower California and mid-continent fields continue active.

Cleveland, Oct. 30.—Jobber orders for pipe are slightly more numerous. Several need material to round out their stocks and each order is wanted in a hurry.

Detroit, Oct. 30.—Sales of tubular products are heavy into the Muskegon, Mich, territory, where oil and gas in huge quantities are being piped. Local jobber demand for full weight merchant pipe is limited to single carloads.

Chicago, Oct. 30.—Tonnage sales of cast iron pipe to gas companies enliven the market. Water pipe sales are confined to many less than carload lots for piecing out subdivision work. Waukegan, Ill., is purchasing 8300 feet of 6-inch and 3070 feet of 8-inch. Prices are firm for the larger diameters at $44.20 to $45.20, delivered Chicago. The minimum applies only on tonnage sales of municipal pipe.

Birmingham, Ala., Oct. 30.—Cast iron pressure pipe shops operate at 75 to 80 per cent. A few new lettings are coming in. Quotations are firm at $36 to $37 on 6-inch and over. Shipments are as steady as production.

CONTRACTS PLACED

45,000 tons, 10-inch line for Roxana Petroleum Co., to Youngstown Sheet & Tube Co. Smaller tonnage to National Tube Co. About 70 or 80 miles of this 450-mile line still to be placed.
7200 tons, 12-inch for Arkansas Natural Gas Co.; to Spang, Chalfant & Co.
7220 tons, 10-inch gas line for Empire Oil & Refining Co.; to Spang, Chalfant & Co.
866 tons, 12-inch class 350, Los Angeles, to American Cast Iron Pipe Co.
720 tons, 6-inch class 350, Los Angeles, to Pacific States Cast Iron Pipe Co.
680 tons, 6 and 8-inch centrifugal cast iron pipe for Edmonds, Wash., water project to United Cast Iron Pipe & Foundry Co.
537 tons, 2 to 12-inch class B, Phoenix, Ariz., to unnamed interests.
145 tons, 18-inch class H, Franklin street improvement, San Francisco, to E. J. Treacy.
100 tons, 8-inch class C water pipe, City of Milwaukee, to Lynchburg Foundry Co., on its bid of $45.25 per net ton, delivered.

CONTRACTS PENDING

40,000 tons, 48-inch cast pipe, Albany, N. Y., contemplated for issuance after election.
13,920 tons, 6 to 30-inch cast pipe, Warwick, R. I. Herbert Kennedy Co., representing French makers, low bidder.
8300 feet of 6-inch and 3070 feet of 8-inch pipe for Waukegan, Ill., J. L. Frey, contractor, low bidder, at $45.50, delivered.
8000 tons, cast pipe, Herkimer, N. Y.; C. L. Wood, superintendent of municipal commission, in charge; bids opened Oct. 29.
6000 tons, miscellaneous sizes for Herkimer, N. Y. United States Cast Iron Pipe &

Foundry Co. low with $193,000 on centrifugal. Other bidders: Wood, $223,000 for centrifugal and Hebert Kennedy Co., representing French makers, $235,000 for sand cast. No action expected until after election.

1284 tons, 24-inch class B, Seattle; bids received.

144 tons, 4 and 6-inch class B, improvement East street, Tulare, Calif. H. E. Conner, Redwood City, Calif., low bidder on general contract.

50 tons, 6 to 12-inch class C, with 50 tons of fittings for Hartford, Conn.

Iron Ore

Cold Weather Slows Ore Movement—October Shipment 8,200,000 Tons

IRON ORE PRICES, PAGE 1136

Cleveland, Oct. 30.—Freezing weather in the Lake Superior district has slowed up the movement of iron ore, but the total for October is estimated by the Lake Superior Iron Ore association at 8,200,000 tons. This will bring the amount for the season to Nov. 1 to 49,465,000 tons, compared with 49,106,000 in the same period last year. The market is quiet, producers devoting all their attention to bringing down sufficient ore to fill contracts on their books.

Tin Plate

Specifications Fair—Market Now in Quiet Season

TIN PLATE PRICES, PAGE 1135

Pittsburgh, Oct. 30.—Tin plate is quiet with operations at the usual low level of the year. Except canmakers most consumers are specifying fairly actively. Announcement of a price for next year is expected soon. At present tin plate is $5.25 a 100-pound base box, Pittsburgh.

Bolts, Nuts, Rivets

Specifications Hold Well and Rivet Demand Grows

NUT AND BOLT PRICES, PAGE 1136

Pittsburgh, Oct. 30.—Specifications for bolts and nuts show little change from the rate a month ago although rivet demand has shown a slight improvement during the past few weeks. Demand is well diversified. Operations are steady at 60 to 65 per cent. Prices hold at 60 to 70 off for bolts and nuts, and 2.90c, Pittsburgh, for large rivets.

Chicago, Oct. 30.—Specifications are picking up steadily for carriage and machine bolts and nuts. Rivet demand is steady in manufacturing lines. Prices for bolts and nuts continue steady at 60 to 70 off. Large structural rivets are 3.00c, Chicago, while small rivets are quoted 70 to 70 and 10 off.

Cleveland, Oct. 30.—Tonnage in nuts and bolts has declined somewhat from September. Orders are less numerous but a good November is indicated. Prices are firm at 70 off, the small buyer being called upon to pay 60 off. In some cases jobbers get 61 off. Rivet business is well maintained without large tonnages.

Sheets

Market Continues Active—Some Automobile Companies Buying for New Models—Prices Strong

SHEET demand is holding up to a high average in all markets. While the majority of mills still have good backlogs, and shipments are deferred from three to six weeks and longer on some grades, current buying is just a shade slower than in recent weeks. Some automotive interests are in production on new models, and taking sheets actively, making up for a loss in other directions.

SHEET PRICES, PAGE 1135

Pittsburgh, Oct. 30.—Sheet buying fails to decline, October specifications of most producers equaling or exceeding those of September. Operations are high but backlogs have been reduced little during the past few weeks. Sales to automotive interests continue unusually active. Some motor car builders who reduced operations a short time ago for model changes again are in production, and are offsetting seasonal decline noted in production by other interests. Other consuming lines, with the possible exception of freight car builders, are specifying actively. Although no announcement is expected for a few weeks it is the impression that an advance will be made on first quarter tonnage. In the meantime, quotations are well maintained, with black sheets at 2.75c, base, Pittsburgh, tin mill black at 2.90c, galvanized at 3.50c, blue annealed at 2.00c, and autobody at 4.00c. The leading producer here continues close to capacity.

New York, Oct. 30.—Sheet demand is well maintained and most mills need at least two to three weeks to schedule shipments. Prices are firm at 2.00c, base, Pittsburgh, for blue annealed, plus an extra of $2 for widths over 45 inches; 2.75c, base, Pittsburgh, for black and 3.50c for galvanized.

Philadelphia, Oct. 30.—Sheet demand is well sustained. October bookings equal those of September. Prices are unchanged.

Youngstown, O., Oct. 30.—Incoming volume of new sheet business with mills in this district almost equals present production which today is at 88 per cent among independent makers. Mill managers expect that by early November they will be receiving another lot of heavy specifications that will carry them through the remainder of this year at about present operating and shipping rates. Prices are firm at 2.75c, base, Pittsburgh, for common black, 3.60c for galvanized, 2.00c for blue annealed and 4.00c for autobody. Talk of higher quotations has turned from autobody, for which 4.25c is likely to be asked for the first quarter, to black, for which some makers propose to ask 2.85c as a minimum and others 2.90c.

Cleveland, Oct. 30.—Instructions to rush shipment accompany each sheet release. In some cases automobile companies issue specifications, but shipment is contingent upon releases to follow. On the higher finishes, deliveries are postdated as much as seven weeks. Operations are nearly full and mills are able to work tonnage into their rollings and render exceptional service. Prices are firm. Some extensive orders were recently received from barrel manufacturers, small portable tank makers and from grave vault interests.

Detroit, Oct. 30.—All grades of sheets utilized by the automotive and allied industries are active. With deliveries on metal furniture, autobody, deep drawing and other high finishes already entering the second week of December, fabricators are showing more concern about deliveries than they are about prices. The 4.00c Pittsburgh price on full finished is entirely firm and a $3 per ton advance is in prospect for first quarter. The Ford Motor Co., has stepped up specifications on material by 20 per cent. Others are increasing and specifications for the new Chevrolet are commencing to show appreciable gains.

Chicago, Oct. 30.—Sheet buying apparently has passed the peak of demand, but orders are well diversified and sufficient to keep mill operations at about 85 per cent. Deliveries are slightly easier. Mills estimate at least 30 days' business in outdoor roofing supplies is before them. The contemplated price advance on black, galvanized and blue annealed sheets may not be made effective for fourth quarter business. Chicago delivered quotations are steady at 2.90c for No. 24 black, 3.65c for No. 24 galvanized, and 2.15c for No. 10 blue annealed.

St. Louis, Oct. 30.—Sheet demand continues brisk and well diversified. Miscellaneous users have been taking relatively large tonnages, particularly galvanized sheets. Shipments on virtually all grades are behind schedule. Prices remain firm.

Founders Will Convene

The thirty-second annual meeting of the National Founders association will be held at Hotel Astor, New York, Nov. 21 and 22. The meeting recently was authorized by the administrative council of the association and a large and enthusiastic group of members is expected to be in attendance.

Structural Shapes

Bridges Swell Western Backlogs—Numerous 1000 to 3000-Ton Awards—Pending Work Looms Large—Subways Let in New York

SHAPE specifications received by western mills reflect recent heavy awards, particularly in bridges. Buildings just contracted for involve relatively high tonnages, 2600 tons at New York, 2100 tons at Ecorse, Mich., 2000 tons at Los Angeles and several others scattered throughout the country taking 1000 tons or more. Fabricators note much work on architects' boards, on which protections are being asked. Boston, Cleveland, Buffalo and Detroit all look forward to active periods if construction goes ahead on buildings now planned. The 7000-ton Zeppelin hangar job at Akron, O., will be rushed. A Manchurian railway job requires 2500 tons. Awards this week total 48,038 tons as against 41,621 tons last week and include 14,360 tons of subway work in New York.

STRUCTURAL SHAPE PRICES, PAGE 1135

Chicago, Oct. 30.—Shipments of plain structural material are heavy on bridge and building work recently placed. For several months bridge awards have been the heaviest in several years in this district and throughout the West and Northwest. Specifications from fabricators now are largely for individual projects in sight, for which protection is desired. A peak buying movement seems to have been passed late in September and early in October. Additional contract sales of light shapes have been closed on the basis of 2.10c, Chicago. Structural material deliveries still are two to five weeks deferred, according to rolling schedules. A well diversified demand is reported from general manufacturers.

A survey by the Chicago association of commerce shows that about 500,000 square feet of new office space has been rented in Chicago since May 1, thus reducing vacancies from 14 to 13 per cent, which is only slightly above the normal vacancy of 10 per cent.

Boston, Oct. 30.—Large structural tonnages loom up for the immediate future. Boston & Maine railroad will erect a hotel alongside its North Union station. Boston's highest office building for the United Shoe Machinery Co. will soon be let. An apartment hotel in Brookline is now being figured. In addition to these major projects, five or six call for 200 to 500 tons each, and will early be awarded. A new high school in Brighton will require 500 tons, and a savings bank building in Providence, R. I., will take 150 tons.

New York, Oct. 30.—Fresh inquiry is not as large as a week ago, but the structural market continues strong. A good volume of orders is being placed and heavy tonnage is under contemplation. Fabricated material prices are unquestionably the strongest in weeks, while shapes are holding at a 2.195c, New York, minimum, this applying only to larger orders.

Philadelphia, Oct. 30.—Shape demand is somewhat smaller but a large amount of tonnage is being figured. In the meantime mills continue to operate practically full on large orders placed in September and early October. Prices continue 2.80c to 2.11c, delivered Philadelphia. The eastern market is based roughly on 2.05c, base, mill, or 1.90c, base, Pittsburgh, and delivered prices are subject to such factors as milling in transit.

Pittsburgh, Oct. 30.—Specifications for plain structural material have declined slightly recently, although total October tonnage compared favorably with the corresponding period of preceding years. Awards are fewer and pending jobs also have been reduced.

Buffalo, Oct. 30.—Pending structural inquiry here took another jump this week with announcement of plans for a sports arena in Broadway avenue. This project originally involved 1700 tons of structural, but now will be larger.

Cleveland, Oct. 30.—Plenty of structural shape business is in the embryonic stage as shown by activity of architects in preparing plans and in announcements from time to time of large projects. One is a lake front terminal at East Fifty-fourth street. Interest at the moment is high in the hangar job to be rushed at Akron, O., the site having been decided upon. About 7000 tons will be required. The largest job let locally this week involves a little less than 500 tons for a bridge for Nickel Plate railroad, to Fort Pitt Bridge Works. Mills report specifications for plain material well maintained and the usual prices are 1.90c to 1.95c, Pittsburgh.

Detroit, Oct. 30.—Structural shape specifications are numerous and involve attractive tonnages. Largest award involved 2000 tons for the Detroit river tunnel. This went to the Commercial Shearing & Stamping Co. A building at Ecorse, Mich., takes 1800 tons and was awarded American Bridge Co. Prospects are bright for two or three months to come, with numerous buildings planned locally and throughout the Michigan territory. Shapes are firm at 1.90c to 2.00c, Pittsburgh, with most invoices carrying a 1.95c, price.

Awards Compared

	Tons
Awards this week	48,038
Awards last week	41,621
Awards two weeks ago	18,364
Awards this week in 1927	19.618
Average weekly awards, Oct.	39,995
Average weekly awards, 1928	39.748
Total awards to date, 1927	1,593,505
Total awards to date, 1928	1,709,172

CONTRACTS PLACED

11,300 tons, subway work, route 108, section 2, New York, to unnamed interests.

6735 tons, buildings, Youngstown Sheet & Tube Co., Indiana Harbor, Ind., including 3935 tons to Hansell-Elcock Co., and 2800 tons(open-hearth building) to McClintic-Marshall Co.

3060 tons, subway work, route 109, section 5-8, New York, to Magor Car Corp.

2600 tons, office building, Madison avenue and Fifty-second street, New York, to A. E. Norton Inc.

2500 tons, bridges at Menominee and Green Bay, Wis., to Wisconsin Bridge & Iron Co.

2100 tons, plant buildings at Ecorse and River Rouge, Mich., for United States Gypsum Co.; to American Bridge Co.

2067 tons involved in the following three awards: Apartment, Ninety-sixth street and Park avenue, New York; and building, 42-46 West Forty-eighth street, New York, both going to Lehigh Structural Steel Co.; and service station for the Willard Parker hospital, to McClintic-Marshall.

2000 tons instead of 1500 tons previously awarded, Lewis building addition, Philadelphia, to Shoemaker Bridge Co.

2000 tons, Bullock's store, Los Angeles, to Llewellyn Iron Works.

2000 tons, segments (with 1800 tons of plates) Detroit river tunel, to Commercial Shearing & Stamping Co., Youngstown, O.

1600 tons, Journal square theater, Jersey City, N. J., to Harris Structural Steel Co.

1165 tons, addition to plant of International Harvester Co., Rock Island, Ill., to Gage Structural Steel Co.; previously reported as 900 tons.

1150 tons, building for Kalamazoo Trust & Savings bank, Kalamazoo, Mich., to American Bridge Co.

1125 tons, Trust & Savings bank, Chicago, to American Bridge Co.

700 ton, Seaside hotel Atlantic City, N. J., to Baker Iron Works.

650 tons, building for harvester assembly, Nichols & Shepard Co., Battle Creek, Mich., to Indiana Bridge Co.

600 tons, addition, Hotel Trailer, Allentown, Pa., to Bethlehem Fabricators, Inc.

600 tons, apartment, 2780 Broadway, New York, to Easton Structural Steel Co.

600 tons, bridges for Southern railway, to American Bridge Co.

500 tons, state highway bridge, Clinton, N. Y., to American Bridge Co.

500 tons, highway bridge, Schoharie creek, Fort Hunter, N. Y.; to American Bridge Co.

478 tons, Nickel Plate bridge, Cleveland, to Fort Pitt Bridge Works.

450 tons, warehouse for Stockham Pipe & Fittings Co., Birmingham, Ala., to Southern Steel Works Co.

450 tons, theater for the Isle Theatrical Corp., St. Mark's place, Staten island, New York, to Harris Structural Steel Co.

350 tons, Zembo masonic temple, Harrisburg, Pa., to Jones & Laughlin Steel Corp.

300 tons, plant extension, Hupp Motor Car Corp., Detroit; to Guibert Steel Co.

265 tons, canopy for La Salle street station, Chicago, for Rock Island railroad, to Eggers-Schillo Co.
250 tons, Catholic school, Camden, N. J., to Shoemaker Bridge Co.
220 tons, panhouse for Improved Cinder Co., Greenpoint, Long Island, N. Y., to Belmont Iron Works.
200 tons, store and office for Plaza Trust Co., 655 Fifth avenue, New York, to La Cour Iron Works.
200 tons, employees' assembly hall, Pennhurst-Penn, Philadelphia, to McClintic-Marshall Co.
190 tons, high school, Elmhurst, Ill., to Midland Structural Steel Co.
170 tons, 3-story cafeteria unit for Evanston township high school, Evanston, Ill., to Wendnagel & Co.
160 tons, bank and office, Wyckoff avenue, Brooklyn, N. Y., to National Bridge Works.
153 tons, subway station, New York, to Harris Structural Steel Co.
150 tons, steel joists, Dithridge apartment building, Pittsburgh; to Kalman Steel Co.
150 tons, plant building for Hercules Powder Co., Kenville, N. J., to Austin Co.
125 tons, building, A. C. Spark Plug Co., Flint, Mich., to Flint Structural Steel Co.
115 tons, foundry addition, Baker-Perkins Co., Saginaw, Mich., to Jackson & Church, Saginaw.
110 tons, Methodist Episcopal church, Muskegon, Mich., to Muskegon Boiler Works.
100 tons, addition to plant of Walker Mfg. Co., Racine, Wis., to Midland Structural Steel Co.
100 to 125 tons, alterations to residence of George F. Baker, 1180 Park avenue, New York, to Eidlitz & Ross.
100 tons, 6-story building addition, 58 Varick street, New York, to Structural Iron Works.
100 tons, armory, Staten Island, New York; to Guibert Steel Co.

CONTRACTS PENDING

17,000 tons, 67-story Chrysler office, Lexington avenue and Forty-second street, New York, general contract awarded Fred T. Ley & Co. Inc., 321 West Forty-fourth street, New York.
15,000 to 19,000 tons for Reading Commercial building, Philadelphia, instead of 10,000 tons previously reported.
3400 tons, Lakeside hospital group, Adelbert road, Cleveland. General contractors John Gill & Sons, taking revised bids on revamped plans.
3300 tons, 28-story office building, Lake Shore drive, Chicago.
2500 tons, cargo handling equipment, South Manchurian railway, Dairen, Manchuria.
2300 tons building, Methodist Book Concern, San Francisco, McClintic-Marshall Co. low bidder.
2200 tons, building, United States Gypsum Co., Philadelphia.
2000 tons, aerial bridge, Duluth; bids submitted exceeded appropriations.
2000 tons, Curtiss Airplane plant addition, Buffalo, James T. Stewart Co., New York, awarded general contract.
1000 tons, addition to Philadelphia general hospital, Philadelphia.
1000 tons, public school 96, Bronx, New York.
1000 tons, buildings for Picatinny arsenal, Dover, N. J.
1000 tons, bridge, Grand Trunk railway, South Bend, Ind. General contract to unknown interest.
950 tons, 16-story apartment, Sixty-seventh street and Central Park west, previously noted as involving unstated tonnage.
900 tons, bank building, Memphis, Tenn.
900 tons, institute for mental diseases, Philadelphia.
850 tons, apartment, 602 East Eighty-fourth street.
565 tons, store building, South State street, Chicago, Mundie & Jensen, architects.
500 tons, Norfolk & Western railroad bridges.
500 tons, City National bank, Battle Creek, Mich. Bids closed Oct. 29.
500 tons, auditorium, Flint, Mich. Bids asked.
500 tons, high school, Brighton, Mass.; to be awarded this week.
425 tons, mill, Weyerhaeuser Timber Co., Longview, Wash.; bids in.
350 tons, additions, Motor Wheel Corp., Lansing, Mich. Jarvis Engineering Co., reported to be low.
300 tons, for state building, Buffalo, bids next week.
200 tons, addition to home for aged, Worcester, Mass. General contract to L. Rocheford & Sons, Worcester.
250 tons, New York-Edison Co., substation, Sixth street, previously noted as involving unstated tonnage.
150 tons, (estimated) 10-story apartment and store building, northwest corner John R and Erskine streets, John R. Erskine Corp., Detroit. Architect preparing plans.
150 tons, savings bank, Providence, R. I.; to be awarded this week.
100 tons, addition, Detroit Gear & Machine Co., Detroit. General contract to Stokes & Whittington, Detroit.
100 tons, bascule bridge, 80-foot draw, over Black river at Fifteenth street, Port Huron, Mich., Grant Trunk railroad. Bids asked.
100 tons, plant and office building, C. H. McAleer Mfg. Co., Lyndon avenue, Detroit. General contract to M. Bartholomai & Son, Detroit.
100 tons, auto salesroom and garage, for M. J. Duryea, Springfield, Mass.

Concrete Bars

Awards and Pending Work Involve Large Lots—Chicago-Cleveland Weak in Price

TWO paper plants in Washington involving 750 tons apiece are among the featured tonnages in concrete bars. Total awards are heavy, involving several taking 500 tons or more. Numerous jobs let both in East and West. One lot 120 tons loaded on boat for Sumatra few hours after order was placed in New York. Slight price weakness is discernible at Chicago and Cleveland.

REINFORCING BAR PRICES, PAGE 1135

New York, Oct. 30.—One of the most spectacular orders for concrete bars placed in this district in a long time has been recorded. The Netherlands Oil Co. divided 240 tons for buildings in Sumatra, between Concrete Steel Co. and Jos. T. Ryerson & Son Inc. The Concrete Steel Co. portion, wanted immediately, was booked at 5 p. m., the bars were cut to length at its Camden, N. J., warehouse over night, were taken in a special 3-car train the next morning and loaded aboard a ship sailing for Sumatra at noon.

Pittsburgh, Oct. 30.—Large awards for concrete bars continue lacking. New inquiry is quiet. October bookings, however, compare favorably with the large September volume.

Buffalo, Oct. 30.—Reinforcing bar demand is now confined to small lots. Current bookings are at 2.51c, Buffalo, on all cut length business.

Cleveland, Oct. 30.—A few general reinforced concrete jobs have been let. The concrete bars in lots of 120 to 190 tons probably will be let this week. Some larger awards, too, are expected. While 1.95c to 2.15c, Pittsburgh, is quoted, sometimes Cleveland is the base used and 1.85c, Cleveland, for mill lengths has not entirely disappeared.

Detroit, Oct. 30.—Exceptional activity for this season of the year characterizes the concrete bar market. Awards are numerous and while an effort is being made to get higher figures, prices realized indicate keen competition on each job let. Several jobs involving 100 to 300 tons each have been closed recently. One of the latter size, the Florence Crittenden home for girls, went to the Gabriel Steel Co.

Chicago, Oct. 30.—While attractive building orders for billet reinforcing bars have brought out prices below 2.15c, Chicago, quotations for smaller work are 2.30c to 3.00c. Rail steel bar prices are fairly well maintained at 2.00c to 2.60c. Bids for approximately 15 miles of road paving and widening, at a cost of more than $600,000 have been taken by the Cook county, Illinois, commissioners. Several school building projects will be announced shortly. Shipments on contracts are heavy.

Awards Compared

	Tons
Awards this week	8,729
Awards last week	7,185
Awards two weeks ago	5,090
Awards this week in 1927	13.677
Average weekly awards, Oct.	6,740
Average weekly awards, 1928	6,905
Total awards to date, 1927	247,260
Total awards to date, 1928	296,801

CONTRACTS PLACED

900 tons, plant building, United States Gypsum Co., East Chicago, Ind., in addition to 600 tons previously awarded, to Calumet Steel Co.
800 tons, apartment, 1420 Lake Shore drive, Chicago, to Calumet Steel Co.
750 tons, second unit Zellerbach paper plant, Port Townsend, Wash., to Pacific Coast Steel Co.
750 tons, second unit Zellerbach paper plant, Hoquiam, Wash., to Pacific Coast Steel Co.
675 tons, warehouse, Sears Roebuck & Co., San Francisco, to Soule Steel Co.
500 tons for Pizer building, Brooklyn, N. Y., to Kalman Steel Co.
500 tons, government work, Washington, to Concrete Steel Co.
400 tons, Y. M. C. A. building, Evanston, Ill., to Inland Steel Co., previously reported to unstated fabricator.
395 tons, highway work, Sonoma county, Calif., to Pacific Coast Steel Co.
300 tons, South Shore Towers apartment, Chicago, to Inland Steel Co.
300 tons, Florence Crittenden hospital and home, Tuxedo and Woodrow Wilson avenues, Detroit, to Gabriel Steel Co.
275 tons, rail steel, reservoir, R. G. Lassiter & Co., Greensboro, N. C., to O. Z. Wrenn & Co.
265 tons, Marine hospital for United States government, Mindmill Pointe, Detroit, through Ring Construction Co., Minneapolis, to Concrete Engineering Co.
250 tons, Occidental hotel, Muskegon, Mich., to Concrete Engineering Co.
240 tons for buildings for Netherlands Oil Co., Sumatra, of which 120 tons each to Concrete Steel Co. and Jos. T. Ryerson & Son Inc.
164 tons, Rubio storm drain, Los Angeles to Blue Diamond Co.
160 tons for Westchester-Oakley garage, White Plains, N. Y., to McClintic-Marshall Co.
135 tons, building, Chrysler Corp., Detroit.

Rail steel.
130 tons, Olive Way apartment and Green Lake fieldhouse, Seattle, to Northwest Steel Rolling Mills.
125 tons, Kerr garage, Cleveland, to Bourne-Fuller Co., through Crowell & Little Construction Co., general contractor.
115 tons, Sawnland hospital, Seattle, to Northwest Steel Rolling Mills.
100 tons for building for Carl H. Schultz Corp., Brooklyn, to Concrete Steel Co.
100 tons, office building, Great Northern railroad, Seattle, to Pacific Coast Steel Co.
100 tons, bag house, Pacific Coast Cement Co., Seattle, to Northwest Steel Rolling Mills.
100 tons, building for Bank of Commerce and Trust Co., Memphis, Tenn., to Laclede Steel Co.
100 tons, including building for United States customs and immigration department, Detroit, to Truscon Steel Co.
100 tons, including footings for National Town and Country club, Detroit, to Concrete Steel Co.
100 tons, miscellaneous work, including warehouse and office buildings for the Federal Steel Corp., Artillery avenue, Detroit, to the Austin Co.
100 tons, including building for the Marmon-Detroit Co., Detroit, to McRae Steel Co.
100 tons, Michigan state road work, to Concrete Steel Co.
100 tons for Telephone building, Glens Falls, N. Y., to Kalman Steel Co.

CONTRACTS PENDING

400 tons, Cook county nurses' home, Chicago. Hall, Lawrence & Ratcliffe, architects.
350 tons, highway work in Ventura county, Calif. Bids received.
300 tons, building for the Hudson Motor Car Co., Detroit. Bids being taken.
300 tons, Lurya Dwellings apartment, Independence boulevard, Chicago. A. L. Himmelblau, architect.
165 tons for building for National Lead Co., Brooklyn, N. Y.
145 tons, laundry on South San Pedro street, Los Angeles. Bids received.
140 tons, Cleveland Clinic hospital addition, East Ninety-third street, Cleveland. General contract to Lundoff-Bicknell Co.
127 tons, highway work, San Luis Obispo county, Calif. Bids Nov. 14.
100 tons, Veterans hospital, Walla Walla, Wash. Bids received.
100 tons, sales and service building, Acme Realty Co., Cleveland. General contract awarded without competition to Sam W. Emerson Co.
Unstated tonnage, pumping plant for city of Detroit, at Connors creek, (also large tonnage of sheet piling). Bids Nov. 14. B. A. Fellows, engineer.
Unstated tonnage for $1,000,000 sewage disposal plant, Grand Rapids, Mich. G. P. Scharl Construction Co., low on preliminary work involving $155,592.
Unstated tonnage, lakefront terminal, East Fifty-fourth street, Cleveland, for Nicholson Universal Steamship Co., Detroit, 4-story building, 100 x 550 feet, to be completed this year.

Refractories

Look to 1929 to Stimulate Repair Work

REFRACTORIES PRICES, PAGE 1136

Pittsburgh, Oct. 30.—Buying of refractory material is steady, with most material being ordered for repair work. New construction here is light. High rate of operations at steelworks this year has necessitated considerable repair work and this is expected to be reflected in the year's volume of business. Shipments so far this year of most sellers are substantially ahead of a year ago, although 1927 was a fairly active period. Prices generally are firm, with first quality fire clay and silica brick at $43 to $46 and second quality material $35 to $38.

Rails, Cars

Four Rail Mills Share Pennsylvania's Order—More Car Orders in Sight—Locomotives Active

GRADUALLY various railroads are placing their rail requirements under order. Pennsylvania is distributing 159,600 tons. Western roads are buying 42,500 tons. More are expected this week, including Detroit, Toledo & Ironton as well as New York Central. Missouri Pacific and Wabash each will buy 3000 cars. Lackawanna places 20 locomotives.

RAILROAD TRACK PRICES, PAGE 1136

Chicago, Oct. 30.—Steel rail orders closed in western territory this week were 40,000 tons for an unnamed western road in a confidential sale, and 2500 tons additional requirements for prompt shipments to western roads. Of the Pennsylvania's 159,600-ton rail order, Illinois Steel Co. gets 31,300 tons, Inland Steel Co. 9500 tons, Carnegie Steel Co. 46,900 tons, and Bethlehem Steel Co., 71,900 tons. The option calls for an increase up to 70 per cent of each order any time prior to October, 1929. The New York Central's 190,000-ton rail inquiry is the chief prospective business in sight. Rail mill operations for the Chicago district are only slightly over 50 per cent. The 13,000 tons for the Detroit, Toledo & Ironton railroad will be closed shortly. Among the western roads already having purchased rails this year are Northern Pacific, 40,000 tons, Great Northern 15,000 tons, and Colorado & Southern 5200 tons.

Sales of track fastenings totaled 2500 to 3000 tons. From 10,000 to 12,000 tons are on inquiry in miscellaneous lots.

It is understood Missouri Pacific will be definitely in the market for 3000 miscellaneous freight cars within a few days; that Wabash will ask bids soon on a similar quantity, and St. Louis-San Francisco has an inquiry in preparation. Missouri Pacific is expected to inquire for 45 locomotives.

New York, Oct. 30.—While domestic car buying for October will substantially exceed September's total of 1378, business from the car builder's standpoint is among the poorest on record. Of 2235 cars placed thus far, 2200 were awarded railroads' own shops. Car builders see encouragement in the fact that approximately 5700 freight cars are pending. This includes 1000 auto cars for the Canadian National railways, likely to be placed in this country. Canadian National has a total of 3300 pending.

Baltimore & Ohio is expected to inquire for a large tonnage of rails within the next two weeks.

Pittsburgh, Oct. 30.—Seasonal expansion is noted in demand for railroad spikes, bolts and other track accessories although the upturn is not unusually great. Part of the 1929 rail requirements of the Pennsylvania railroad will be rolled in this district since the Carnegie Steel Co.'s share is 46,900 tons.

Buffalo, Oct. 30.—Lackawanna plant of the Bethlehem Steel Co. has been directed to produce 7500 tons of a rail order recently placed by Erie with this corporation. This is the initial large tonnage allocated to the recently modernized rail mill at Lackawanna.

CAR ORDERS PLACED

Delaware, Lackawnna & Western, 100 automobile cars, to American Car & Foundry Co.
New England Fuel & Transportation Co., 100 mine cars to Bethlehem Steel Co.
Norfolk & Western, 500 all-steel automobile box cars, to its own shops at Roanoke, Va.
Southern Pacific, 300 box cars, to own shops.
Swift & Co., 300 refrigerator cars, to own shops.

LOCOMOTIVES PLACED

Alaska railroad, one locomotive, to Baldwin Locomotive Works.
Delaware, Lackawanna & Western, 20 locomotives, to American Locomotive Co.

CAR ORDERS PENDING

Canadian National, 70 miscellaneous coaches now pending; portion of these was previously noted.
Chesapeake & Ohio, six gasoline-electric rail motor cars.
Chiriqui Land Co., Panama, 50 freight cars of 15 tons capacity.
Norfolk & Western, 10 steel express cars and five steel mail and baggage cars.
Richardson Refining Co., Fort Worth, Tex., inquiring 200 tank cars of 9000 gallon capacity each.
Rock Island, inquiring 15 steel suburban coaches.

LOCOMOTIVES PENDING

Manufacturers Railway Co., two switch engines.
Pacific Fruit Express, one locomotive.

Japanese Industries To Be Inspected

Inspection tours to the reconstruction works in Tokio and Yokohama, the dockyards at Nagasaki, the government iron and steel works at Yawata and the collieries at Miike will be arranged in connection with the World Engineering congress to be held in Tokio, Japan, in Feb., 1929. At present several hundred committees throughout the United States are arranging for American attendance at the congress and for papers to be delivered at technical sessions by leading American engineers.

Strip

Deliveries Deferred and Users Specify Heavily—New Price Plan Generally Followed

STRIPMAKERS generally are putting into effect the revised method of quoting recently agreed on and buyers are making no objection. With deliveries uncertain because of heavy backlogs, delivery is more of an object than price. Most tonnage now being shipped is billed at prices prevailing several weeks ago. Automotive consumers continue to specify heavily.

STRIP PRICES, PAGE 1136

Pittsburgh, Oct. 30.—Strip specifications continue close to a record level, with most producers able to maintain their backlogs. Practically all sellers have gone to the new card of extras or intend doing so and have instituted the new base price of 2.00c, Pittsburgh, for 6 inches and less and 1.90c for 6 1/16 inches to 24 inches. Most consumers, however, are under contract at old prices quoted on three different sizes up to 12-inch.

New York, Oct. 30.—Strip steelmakers continue to ask the new prices announced about 10 days ago. These are 1.80c to 1.90c, base Pittsburgh, for hot rolled, 6 to 24 inches, 1.90c to 2.00c, base Pittsburgh, for hot rolled less than 6 inches wide, and 2.85c, base, Pittsburgh, for cold rolled strip steel. Specifications against contracts continue fairly active, although not as brisk as during September.

Philadelphia, Oct. 30.—Strip steel demand is fairly well maintained. The new prices have been done on some tonnage—1.80c to 1.90c, base, Pittsburgh, on hot strip 6 to 24 inches and 1.90c to 2.00c on less than 6 inches. However, most consumers were covered at the old prices to the end of 1928. Cold strip usually is 2.85c, base, Pittsburgh, but 2.85c has not disappeared.

Cleveland, Oct. 30.—Hot and cold strip demand is well sustained. Several automobile companies and numerous parts makers are up to their September buying rate. Hot strips are gradually becoming more clarified as to price, with two bases. On cold strips, while some have figures of 2.85c to 2.95c, Cleveland-Pittsburgh, a few sellers still retain the 2.75c figure for preferential users. One maker quotes 2.75c for single carloads of a size, 2.85c for mixed carloads, and 3.00c for 5 to 10-ton lots, but the latter base also is subject to regular quantity differentials. Some buyers are more interested in shipping dates than lower figures. Deliveries are deferred four to five weeks.

Detroit, Oct. 30.—Some sales of cold strips are reported made on the new and and higher base of 2.95c, Pittsburgh. Shipments, however, are heavy against lower-priced contracts at 2.75c to 2.85c. Competition is keen for hot strip business but progress is made in the application of the new card of extras with a base of 2.00c, Pittsburgh for 6-inch and under and 1.90c, base, Pittsburgh, for 6 1/16-inch to 24-inch. Shipments are heavy to the automotive industry, calls for expedited deliveries being received daily.

Cold Finished Steel

Bookings Continue in Large Volume, With Prices Firm

COLD FINISHED PRICES, PAGE 1135

Pittsburgh, Oct. 30.—October tonnage of cold finished steel was slightly below the heavy September volume but compared favorably with figures for this period in preceding years. Specifications from automotive interests are steady, except in a few instances where model changes or inventory-taking have occasioned a slackening in operations. The market is firm at 2.20c, Pittsburgh.

Cleveland, Oct. 30.—Additional attractive orders have been received by cold bar finishers. Much is indirectly automotive in character. Other consuming lines also are represented. The price is rm at 2.25c, Cleveland. Dec. 10 is the closing date for receiving specifications against fourth quarter contracts.

Detroit, Oct. 30.—An extraordinary demand for cold finished bars for this season of the year still exists, although sellers admit a slight decline in tonnage was experienced last week. The 2.20c, Chicago-Pittsburgh base is observed by everybody.

Will Install Furnace Top

Jackson Iron & Steel Co., Jackson, O. blew out its Jisco stack Oct. 25 for remodeling. A Dovel-type metal top surmounted by a McKee-type revolving top and a pig casting machine will be installed during the shutdown.

Manhattan Terrazo Brass Strip Co., New York, has increased its capital from 250 to 1248 shares of no par value stock.

Wire

Quiet, Steady Demand for Wire, with Nails Lagging—Prices Gain in Steadiness in Most Markets

MANUFACTURERS using wire in their operations are taking tonnage steadily and furnishing mills the foundation of steady operation. Prices have gained firmness and shading is now almost unknown. Nails continue to be in less demand than wire. Jobbers seem to have sufficient stocks to preclude the necessity for further buying. Specifications continue satisfactory.

WIRE PRICES, PAGE 1136

Chicago, Oct. 30.—Specifications for manufacturers' wire are steady. Most users are specifying at the September rate. Demand for nails lacks the activity of wire. Jobbers' stocks are heavy and buying from that source has declined again. Prices are reported steady on the basis of 2.45c, Chicago or western mill, for bright plain wire, and $2.60 for wire nails.

Worcester, Mass., Oct. 30.—Wire buying continues steady at firm prices, 2.55c, Worcester base, for plain wire. Specifications are more numerous, but in limited lots. Demand for specialties and manufacturers' wire is strong and utilities are also specifying against last quarter needs more liberally.

Pittsburgh, Oct. 30.—Manufacturers' wire is moving actively for practically all leading consumers and total tonnage in October of most sellers exceeded that of September. Wire nails continue to lag behind plain wire. Demand for wire products for the agricultural districts has been slow to expand recently. Prices are firm at 2.40c, Pittsburgh, for plain wire and $2.55 for wire nails.

Cleveland, Oct. 30.—Wire nails continue more or less sluggish. The price is firm at $2.55, Cleveland-Pittsburgh, more so than a few weeks ago. Wire specifications are well maintained. The 2.40c, Cleveland-Pittsburgh, price applies.

Detroit, Oct. 30.—Wire specifications are enlarging. Nail tonnage is limited but increasing. The nail price is firmer. Purchases of nails for boxing of automobiles for export, have been a recent feature of the market in the Detroit district.

Most American blast furnaces were still of a primitive type in 1870. Probably the best of them produced about 50 tons of pig iron per day.

Nonferrous Metals

Tremendous Pressure From Buyers Forces Prices on Copper and Its Products to Rise Rapidly—Lead Also Active

Prices of the Week, Cents a Pound

	Copper			Straits Tin		Lead	Lead East	Zinc	98-99%	Spot	Ingot
	Electro delivered	Lake delivered	Casting refinery	New York Spot	New York Futures	New York	St. Louis	St. Louis	Aluminum	Antimony	Nickel
Oct. 24	15.50	15.57½	15.25	48.50	48.50	6.50	6.32½	6.25	23.90	10.37½	35.00
Oct. 25	15.75	15.80	15.56	48.55	48.60	6.50	6.32½	6.25	23.90	10.37½	35.00
Oct. 26	15.75	15.82½	15.50	48.50	48.50	6.50	6.32½	6.25	23.90	10.50	35.00
Oct. 29	16.00	16.07½	15.97½	49.50	49.25	6.50	6.32½	6.25	23.90	10.50	35.00
Oct. 30	16.00	16.06¼	15.87½	49.25	49.25	6.50	6.32½	6.25	23.90	10.50	35.00

NEW YORK, Oct. 30.—The rapid rise of copper and its product prices under tremendous pressure from buyers, is the outstanding feature in the nonferrous metal market this past week. Lead also has been active but zinc and tin have been quiet. Nickel and aluminum are in firm markets with big tonnages moving.

Brass and copper mill products have gone up twice in the past week, each time by ¼ to ⅜-cent. The copper products have moved by the larger fraction. The mills are running to capacity in all lines, and order books are well filled for the rest of the year. In some departments more orders can be accepted but in others it is difficult to get delivery before the end of the year. Some business has been placed for January but not a great deal.

Copper—The past week was a repetition of other recent weeks, with the price jumping ¼-cent at a time, from 15.50c, Connecticut, to 16.00c. Midwestern prices were strong, ⅛-cent higher. Domestic users entered the market with a rush for January shipment, returning after each increase with undiminished insistence. Demand was so big that producers turned much of it away, but apportioned what sales they accepted among their customers. If all inquiries had been accepted in the order received, there would have been danger of selling out January or most of it to a few buyers, leaving other customers with insufficient metal. Export sales were much heavier than average, for December-January. A little domestic demand came out for this year and it was difficult to find metal against it.

Zinc—Prime western metal has been unusually quiet since the more active period about a week ago. Producers continue to hold to 6.25c East St. Louis, which has ruled for the unusually long period of three months. The ore market is similarly steady at $40 a ton. High grade zinc is unchanged with a large tonnage moving.

Tin—After a little easiness, tin went up on Monday but became easy again immediately afterward. Buyers have refused again to do very much. The market has strong support abroad but here there is little if any bullish sentiment. The premium on spot disappeared several days ago but in the past day or two this situation has been uncertain, with the market wavering between a situation of all positions for one price and a slight premium on spot again. Arrivals of tin have been large this month and supplies appear to be fully keeping pace with large consumption. The market is interested in seeing what will happen when trading is opened on the new National Metal exchange next month.

Lead—Prices are firm and buying is of fair size. Metal for November shipment is well sold.

Aluminum—Prices are unchanged and firm.—*Daily Metal Trade.*

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	20.50
Copper, hot rolled	25.00
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	9.75
Zinc strip (100 pound base)	8.75
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	25.50
Copper	26.37½
RODS	
Yellow brass (high, full turnings)	18.37½
Naval brass	21.00
WIRE	
Copper, car lots	17.87½
Yellow brass (high)	21.00

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	10.00 to 10.25
Chicago	10.25 to 10.75
Cleveland	10.75 to 11.00
HEAVY YELLOW BRASS	
Cleveland	8.00 to 8.25
ZINC	
New York	3.50
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
New York	12.75 to 13.00
Boston	12.50 to 12.75
Chicago	12.00 to 12.50
Cleveland	13.00 to 13.25
RED BRASS BORINGS	
New York	9.00 to 9.50
YELLOW BRASS TUBING	
Cleveland	8.25 to 8.50
LIGHT COPPER	
New York	11.00 to 11.25
Chicago	11.00
Cleveland	11.50 to 11.75
LIGHT BRASS	
Boston	6.25 to 6.50
Chicago	6.25 to 6.75
Cleveland	6.25 to 6.50
ALUMINUM	
Clippings, Cleveland	17.75 to 18.00
Borings, Cleveland	8.75 to 9.00
Cast, Cleveland	12.75 to 13.00
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt Aluminum No. 12	15.50 to 16.50
Brass ingot, 85-5-5-5	13.75 to 14.00

Coke By-Products

Better Toluol Prices Expected to Stimulate Production

New York, Oct. 30.—With quotations on toluol and benzols now firmly established at higher levels, distributors believe needed production will be stimulated. Solvent naphtha and xylol are unchanged, with demand moderate.

Sellers of sulphate of ammonia report that while fertilizer manufacturers have not been moving their product as well as expected, this has had no effect upon the volume of specifications against ammonia contracts. Whether this sluggish movement of fertilizer will affect sulphate ammonia sellers later is not definitely known; however, some regard this development as significant. Meanwhile, the domestic market is holding at $2.30, delivered, and the foreign market nominally at $2.35, port, for material in double bags.

Naphthalene is quiet, with prices unchanged at 6 to 7 cents, works, for both flakes and balls.

Coke Oven By-Products

Per Gallon at Producers' Plant in Tank Lots

	Spot
Pure benzol	$0.23
90 per cent benzol	0.23
Toluol (nominal)	0.40
Solvent naphtha	0.30
Commercial xylol	0.30
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.06 to 0.07
Naphthalene balls	0.06 to 0.07
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.30

Quicksilver Is $125

New York, Oct. 30.—Quicksilver is unchanged at $125 a flask and the market is quiet.

The name of the Eagle Textile Machinery Corp., New York, has been changed to the Eagle Mfg. Co.

Warehouse

Diversified Orders Placed by All Classes of Buyers Send October's Aggregate High—Sheets Raised at Pittsburgh

PURCHASES from warehouses run the gamut of the entire list of iron and steel thus sold. Most jobbers, except in Cincinnati, find October shipments ahead of last year. Sheet buying is featured at Chicago and Detroit. Structural price weakness has disappeared at Buffalo. Black and galvanized sheets have been raised $3 per ton at Pittsburgh by jobbers still granting 2 per cent off for cash.

Boston—Materials move freely. Prices hold firm, the slight weakness in structural having vanished.

New York—Jobbing demand here continues active, with structurals moving particularly well.

Philadelphia—Jobbers report an improved volume with firm prices unchanged. The use of quantity differentials appears to be spreading to distant points.

Buffalo—October sales approach a record volume for the month, with a broad movement of all materials. All classes of buyers participate. Prices are firm. Inquiries indicate November business will be up to average.

Pittsburgh—Although most jobbers have reduced their cash discount on sheets from 2 per cent to one-half of 1 per cent, some still allow the old rate but have advanced their prices $3 a ton on black and galvanized. The former is quoted at 3.55c to 3.80c for No. 24 gage, while the same size of galvanized is 4.40c to 4.55c. No. 10 blue annealed continues 3.00c to 3.10c. Prices on other products are firmer following recent mill advances. Demand is good with small shapes slightly more active than bars. Sheets hold to their previous high rate.

Cleveland, Oct. 30.—Demand involves the entire list of steel products. October aggregate for mill warehouses is the best in several years. Other jobbers report October ahead of last year.

Detroit.—Sheets, especially galvanized corrugated are among items moving well from warehouses. Aggregate demand holds up because of increasingly deferred mill deliveries. Contractors are buying under cover by cold weather. Prices are unchanged.

Cincinnati—Warehouse shipments are up this week after a slight letdown last week. October's tonnage is much below last year. Material used in building and in concrete work is moving better.

Chicago—Steel sheet jobbing continues at a high rate. Bar demand is so good, warehouses are obliged to carry heavier stocks than usual.

St. Louis—Demand holds at high levels and outlook for the remainder of the year is exceptionally good.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles	3.30c
New York †††‡	3.25c
Philadelphia*	2.80c
Pittsburgh	2.90c
Portland	2.50c
San Francisco	3.15c
Seattle	3.90c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.50c
New York††	2.80c to 3.24c
Philadelphia*	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.25c to 3.00c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.80c to 3.24c
Philadelphia	2.85c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.70c
Pittsburgh	3.00c
Portland	2.90c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.70c
Phila., 3/16-in.*	2.90c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.90c
Portland	3.75c
Philadelphia *†	3.00c
Pittsburgh**	3.00c to 3.10c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.54c

NO 24 BLACK SHEETS

Baltimore	3.10c to 4.00c
Boston	5.00c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.50c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York†††	3.70c to 3.80c
Philadelphia*†	3.85c
Pittsburgh‡	3.55c to 3.80c
Portland	4.90c
San Francisco	4.95c
Seattle	5.00c
St. Louis	4.10c
St. Paul	3.95c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore	4.10c to 4.75c
Boston	5.85c
Buffalo	4.70c to 4.85c
Chicago	4.65c
Cincinnati	4.75c
Cleveland	4.35c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York†††	4.25c to 4.50c
Philadelphia*†	4.60c
Pittsburgh‡	4.40c to 4.55c
Portland	5.50c
San Francisco	5.40c
Seattle	5.50c
St. Louis	4.95c
St. Paul	4.90c
Tulsa	6.50c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	4.00c
Philadelphia*	3.35c
Pittsburgh	3.60c
Portland	3.75c
San Francisco	4.10c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.50c to 4.66c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.25c
Cleveland	3.65c
Detroit	4.15c
New York‡‡	4.50c
Philadelphia*	3.60c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore	3.35c	3.85c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.45c	3.95c
Pittsburgh	3.60c	4.10c
Portland (a)	4.75c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.76c	5.26c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	13.00c
Iron bars, rounds	6.10c
Iron bars, flats and squares	6.50c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. ‡10 to 24 bundles. **25 or more sheets. *†50 or more bundles. †††Newark-Jersey City 4.00c on black and 4.70c on galvanized the more prevalent figures.

Pacific Coast

Building Awards Total Well—Imports Show Higher Total—Prices Hold Firm

CONSTRUCTION on the Pacific coast brought good tonnages of reinforcing, cast iron pipe and structural steel to the point of closing contracts. Much tonnage remains on inquiry with every probability most of it will be closed in the next few weeks. Imports of iron and steel in July were slightly above those of June. Pig iron and coke trading continues dull.

San Francisco, Oct. 27.—(*By Air Mail*)—Among awards of iron and steel products on the coast this week were 675 tons of concrete bars for the Sears, Roebuck & Co. warehouse in San Francisco, 1586 tons of cast iron pipe for Los Angeles and 2000 tons of structural steel for Bullock's store in Los Angeles. New inquiries are slow and demand, generally, has eased off.

Importations of foreign iron and steel products on the Pacific coast during July, were slightly higher than the total for the previous month. The figures for the major items are as follows:

	July, 1928 Tons	June, 1928 Tons	July, 1927 Tons
Pig iron	1,248	1,441	1,050
Coke	4,659	4,901	3,054
Bars	3,615	2,487	2,199
Shapes	1,428	1,455	2,192
Cast iron pipe	4,135	1,231	2,375
Tubular products	2,157	2,169	4,158

Pig Iron and Coke

Movement of foundry pig iron and coke continues limited and current inquiries all call for small lots for prompt shipment. No change in prices has taken place.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Awards of concrete bars this week totaled 1862, the largest total in over six weeks. To date this year 73,682 tons have been booked as compared with 49,490 tons for the corresponding period last year. The Pacific Coast Steel Co. took 395 tons for highway work in Sonoma county, Blue Diamond Co. secured 164 tons for the Rubio storm drain, Los Angeles, and Soule Steel Co. booked 675 tons for the Sears, Roebuck & Co. warehouse in San Francisco. More than 7700 tons are now up for figures. Little improvement is noted in price on out-of-stock material, 1.80c base prevailing both here and in Los Angeles. This compares to 2.35c c.i.f. on mild steel bars.

Pending plate business includes 185 tons for 20-inch short pipe for the United States engineer's office, San Francisco, and 231 tons for a 24-inch riveted pipe at Seattle, bids on which have been opened. Awards totaled 330 tons, bringing the aggregate for the year to 33,172 tons as compared with 62,209 tons for the same period in 1927. The Pacific Coast Engineering Co., Oakland, secured 100 tons for ball joints. Prices remain at 2.20c to 2.25c c.i.f.

Although more than 7000 tons of structural material is up for figures only one award of importance was placed this week. The Llewellyn Iron Works took 2000 tons for Bullock's store at Los Angeles. Awards totaled 2169 tons and brought the aggregate for the year to 113,277 tons as comcared with 122,527 tons for the corresponding period last year. Bids have been opened on 2300 tons for the Methodist Book Concern building., San Francisco, McClintic-Marshall Co. being low bidder. Prices on plain domestic shapes continue firm at 2.35c c.i.f.

Other Finished Material

Demand for cast iron pipe is improving slightly and awards this week totaled 3306 tons. Los Angeles placed 720 tons with the Pacific States Cast Iron Pipe Co. and 866 tons with the American Cast Iron Pipe Co. The United States Cast Iron Pipe & Foundry, Co. took 659 tons of various sizes of pipe for a street improvement project in Honolulu. Bids were opened this week on 1284 tons for Seattle, alternate bids being taken on riveted steel pipe. Grinnell Co. secured 300 tons of 4-inch gas pipe for the Santa Maria Gas Co., Santa Maria, Calif.

Seattle Buys Much

Seattle, Oct. 24.—Awards of several large steel contracts in the Pacific Northwest this week featured the market, tonnage lettings exceeding 4000 tons. These included 2050 tons of reinforcing, 1650 tons of plates and tubes and 700 tons of cast iron pipe.

The Puget Sound Machinery Depot, Seattle, has contracted to build ten locomotive boilers for the Great Northern railroad for locomotives to be built at its shops at Hillyard, Wash. They will each require 60 tons of plates and 30 tons of tubes, rivets and other steel. The boiler contract given the Seattle plant follows a similar job executed for the same company last year.

Pig iron and coke are unchanged. No large tonnages of iron have been purchased during the fortnight as local plants are well supplied and many of them have already contracted for first half deliveries. Victoria coke is steady at $13.50 and Tyneside at $13.25 and about 2000 tons have been bought at these prices for first quarter.

Bar, Plates and Shapes

While there is no active demand for merchant bars, reinforcing material in small tonnages is keeping the two local mills on unchanged operations. The aggregate of orders placed is up to normal. Mill prices of merchant bars are firm at 2.35c and reinforcing at 2.20c. Reinforcing awards this week were in excess of 2000 tons. The Pacific Coast Steel Co. booked 1600 tons, including 750 tons for the second unit of the Zellerbach paper plant at Port Townsend, and a similar tonnage for the same corporation's second unit at Hoquiam. For the Great Northern railroad office building at Fourth and Union streets. Seattle, the same plant will furnish 100 tons. The Northwest Steel Rolling Mills booked 450 tons as follows: 130 tons for Olive Way apartment and Green Lake fieldhouse; 115 tons for Dawnland hospital; 100 tons for the Pacific Coast Cement Co.'s bag house and 100 tons for miscellaneous building jobs and state highway work.

The Puget Sound Machinery Co. has placed an order for 600 tons of plates with the Bethlehem Steel Co., to be used in building ten locomotive boilers for the great Northern. The same plant also has the contract for 15 high pressure boilers for the Zellerbach paper plants at Port Townsend and Hoquiam. This job involves 750 tons of plates which will also be furnished by Bethlehem. Mill prices of plates are generally quoted at 2.25c.

Finished Materials

The jobbing business is active. While there is not much mill buying, turnover is satisfactory and October will show better than normal totals.

After several weeks of figuring, contract for furnishing 680 tons of centrifugal cast iron pipe for the Edmonds water system was let this week to the United States Cast Iron Pipe & Foundry Co. The original specifications called for 1042 tons of pipe and additional awards may be made in the near future. The same manufacturer also booked 25 tons of cast iron involved in the Hood river, Oreg., water project.

Stack Out at Chicago

Chicago, Oct. 30.—No gain has been made in steelworks operations in this district. An easier situation as regards fresh business for the heavier mills has checked the ingot operating rate at 85 per cent. In addition, Illinois Steel Co. has taken out a furnace at South Chicago, leaving 14 of its 27 furnaces in blast. Of the 36 steelworks stacks in the district, 22 are active. Inland Steel Co. expects to put in the furnace recently blown out for repairs early in December.

Earnings of Steel Corp. Gain Sharply

Net earnings of the United States Steel Corp. for the third quarter of 1928 made the best showing of any three months period this year. They were far in excess of those for the corresponding period of 1927. The net was $52,148,476 compared with $46,932,968 in the preceding quarter and $41,373,831 one year before. For the first nine month the Corporation reported net of $140,015,494, against $132,999,016 in the three months period ended with June. Monthly figures show that August earnings were the best for the quarter. The figures of earnings by months follow:

Months	1928	1927	1926
January	$11,899,549	$13,513,787	$13,810,149
February	13,581,337	14,943,305	14,385,381
March	15,453,146	17,128,633	16,865,755
First quarter	$40,934,032	$45,584,725	$45,061,285
April	13,927,481	15,449,965	15,705,202
May	16,646,845	15,566,192	16,159,866
June	16,538,660	15,024,303	15,949,037
Second quarter	$46,932,986	$46,040,460	$47,814,105
July	16,133,679	13,808,983	17,798,795
August	18,597,178	14,289,325	17,244,097
September	17,417,619	13,275,523	17,583,934
Third quarter	52,148,476	41,373,831	52,626,826
Nine months	140,015,494	132,999,016	145,502,216

After all charges but before dividends the Corporation reports a net income of $29,886,259 compared with $25,868,758 three months before and $21,585,425 one year ago. The comparative income statement by quarters follows:

	Third Quarter 1928	Second Quarter 1928	Third Quarter 1927
Net earnings	$52,148,476	$46,932,986	$41,373,831
Depreciation	14,837,905	13,614,451	12,389,587
Sinking Fund	2,937,113	2,889,634	2,907,108
Interest	3,991,128	4,045,422	4,133,629
Premium Bonds Redeemed	496,071	514,721	358,082
Net Income	29,886,259	25,868,758	21,585,425
Preferred Dividends	6,304,919	6,304,919	6,304,919
Common Dividends	12,453,411	12,453,411	12,453,411
Surplus	11,127,929	7,110,428	2,827,095

Earnings for nine minths were somewhat less than those for the like period of 1926, when $145,502,216 was reported.

Warns of Car Shortage

Pittsburgh, Oct. 30.—Shippers in the Allegheny region are being urged by the regional advisory board to use precautionary measures to prevent a freight car shortage, despite the fact that such a condition is far from a reality at present.

Pig Iron Prices Stronger

(*Concluded from Page* 1137)

increases are reported from northern furnaces, and indications are that a number of these furnaces are booked to capacity for several months. Should prices further increase at the northern furnaces, it is reported Ironton furnaces will blow in again.

Philadelphia, Oct. 30.—A fair amount of buying features the pig iron market, restricted mainly to small and moderate size tonnages, and principally for shipment this year. Inquiries for foundry iron aggregating 3000 to 5000 tons are appearing for first quarter. Eastern Pennsylvania makers generally are asking $20.50, base, furnace, for first quarter and some are quoting this figure for November and December, but $20, base, has not disappeared. Buffalo foundry iron was sold in this district in the past week at $17.50, base, Buffalo, for this and first quarter, but the usual asking price for any delivery now is $18, base, furnace, while one maker is asking $18.50. The market for basic is quiet, but considerable tonnage is expected to be bought shortly. Round tonnages of low phosphorus iron were sold in the week at $23.50 to $24, base, eastern Pennsylvania for the copper-free grade. Coppear bearing, low phosphorus is bringing $23, base, furnace.

Youngstown, O., Oct. 30.—Sales of malleable pig iron totaling several hundred tons have been made by a local steelworks interest at $18, valley. Some inquiries for bessemer iron have appeared for delivery in this and next quarter. The last sale of bessemer was made here at $18, furnace, but the holder of the only available stock of that grade in the valleys refuses to sell below $20, furnace. All local steelworks interests in this district and, it is understood, in the Cleveland district, are out of the market this year for basic and bessemer. Rumors are heard that the Struthers Furnace Co. plans to relight its stack but Receiver Hugh Grant has not confirmed this report.

Chicago, Oct. 30.—Northern malleable and No. 2 foundry iron were advanced 50 cents today, the fourth rise since Aug. 20, to $19.50, base, Chicago furnace. No. 1 foundry now is $20.

October pig iron shipments amounting to over 250,000 tons are estimated to be 15 to 20 per cent more than in September. Stocks are low, particularly the higher silicon grades. Supplies in hands of middle interests are tight. Shipments are going into consumption, as no evidence is seen of consumer stocks. Inquiry for malleable is increasing. A sale of 4000 tons of malleable was closed in western Michigan. More foundry and malleable orders have been booked for first quarter.

The By-Products Coke Corp. will start work soon on a substantial increase in capacity of its plant in South Chicago, as announced today. It is not stated whether additional furnaces will be built, but capacities of its present two blast furnaces may be doubled. Coke production facilities of the company also are likely to be increased.

St. Louis, Oct. 30.—Pig iron sales during the past two weeks were the heaviest of any similar period this year. Bookings in the past several days include approximately 18,000 tons. Malleable shops are operating full time, with several working extra shifts. Sales of malleable aggregated 3000 tons, the largest single transaction involving 2000 tons for a nearby Illinois user. Job foundries in Missouri, Iowa, Illinois and Indiana took about 11,800 tons, and stove manufacturers in those states purchased close to 2200 tons. Engine and machine builders took 3000 tons. A local steel interest added 2000 tons to its recent purchase of basic. The leading local producer reports October sales and shipments will exceed those of any single month in its history. This interest expects to dispose of approximately 50,000 tons this month. Prices are firm.

Birmingham, Ala., Oct. 30.—Pig iron sales are confined to small consumers who buy for a few weeks. Larger melters have covered for the remainder of the year. Eighteen blast furnaces in Alabama are in operation. The leading interest has been exporting pig iron, more than 5000 tons to be moved this month by barge out of Birmingham. Prices are firm.

Toronto, Ont. Oct. 30.—Spot pig iron business continues at a high level. Some inquiry has come out for as much as 500 tons for immediate delivery. Prices are strong.

A. M. Byers to Build Plant at Ambridge, Pa., and Revamp Its Southside, Pittsburgh, Works

PITTSBURGH, Oct. 30.—A. M. Byers Co. plans construction of a plant at Ambridge, Pa., which in addition to equipment for the manufacture of wrought iron by the Aston process will include a 40-inch blooming mill, 42-inch universal plate mill, 18 and 16-inch continuous skelp mill and a 14 and 9-inch continuous skelp mill. The cost is estimated at $10,000,000, and it will have an annual capacity of 360,000 tons of skelp and plate.

The complete plans of the Byers company include a blast furnace, pipe mills and a river terminal. A site of 112 acres has been purchased. The first unit is expected to be completed in a year. Only a portion of the wrought iron output of the new plant at the outset will be used by the Byers company, the remainder to be sold. Production of mechanical puddled iron at its Warren, O., plant will be continued.

Hand-puddling furnaces at the company's southside works in Pittsburgh will be dismantled and the space utilized for the construction of a new buttweld pipe furnace, which will give the company four. Other plant facilities will be expanded.

H. A. Brassert & Co., Chicago, have the engineering contract for the new Ambridge plant. This company is designing the new tin plate mill for the Columbia Steel Corp. at Pittsburg, Calif.

Pig Iron Output Again Gains

Production Rate Jumps from 102,120 Tons to 107,549 Tons Per Day and Is Best Since May, 1927—Active Blast Furnaces Total 194, Same as Last Month

SHOWING an increase for the fourth consecutive month, production of coke pig iron in October rose to a daily rate which was the highest since May, 1927. According to an estimate compiled by IRON TRADE REVIEW largely from telegraph reports from the country's blast furnaces, the total output in the month just passed was 3,334,024 gross tons and the daily rate was 107,549 tons. This was in spite of the fact that the number of active furnaces on Oct. 31 was 194 and the same number as was producing iron on Sept. 30.

Compared with the total of 3,063,593 gross tons made in September, the October production was an improvement of 270,431 tons. October, however, was a one-day longer month than September. The daily rate of 107,549 tons showed an increase of 5429 tons, or 5.3 per cent, over the 102,120-ton rate of the month before. The highest rate previously attained in 1928 was 106,219 tons per day in May, while the rate of May, 1927, was 109,388 tons.

Thus far this year, pig iron output has totaled 31,117,786 gross tons, against 30,929,041 tons in the ten months of 1927 and 32,773,774 tons in 1926. Average daily production for this year has averaged 102,025 tons, against 101,740 tons in the same period of last year and 107,808 tons in 1926.

During October, 1 merchant blast furnace was blown in and 2 blown out. Of the nonmerchant or steelworks class, 8 were blown in and 7 blown out or banked. Of the 194 stacks active on the last day of October, 40 were merchant and 154 nonmerchant. Operations in the month just passed were 79.3 per cent, as compared with 75.2 per cent in September and 64.5 per cent in the same month one year ago.

With the sale for scrap of the two Warwick furnaces of the Warwick Iron & Steel Co., Pottstown, Pa., the total number of serviceable furnaces in the United States has been reduced from 340 to 338.

Furnaces blown in during the month were: In Pennsylvania: Bethlehem F and Cambria F, Bethlehem Steel Co.; Edgar Thomson E and J, Duquesne No. 3 and Carrie No. 2, Carnegie Steel Co.; Swedeland No. 3, Alan Wood Iron & Steel Co.; Sharpsville, Allen S. Davison Co.; one Eliza, Jones & Laughlin Steel Corp.

Stacks blown out in October were: In Ohio: Jisco, Jackson Iron & Steel Co.; Martins Ferry, Wheeling Steel Corp. In Pennsylvania: Cambria H, Bethlehem Steel Co.; Clairton No. 3, Carnegie Steel Co.; Swedeland No. 2, Alan Wood Iron & Steel Co. In Tennessee: Rockdale, Tennessee Products Corp. In Alabama: Ensley No. 5, Tennessee Coal, Iron & Railroad Co. In Illinois: South Works No. 6, Illinois Steel Co. In Indiana: One Madeline, Inland Steel Co.

MONTHLY PRODUCTION

	1928	1927	1926	1925
Jan.	2,855,515	3,101,346	3,319,789	3,372,207
Feb.	2,898,668	2,940,604	2,923,850	3,214,067
Mar.	3,199,175	3,482,107	3,458,171	3,571,422
April	3,181,975	3,424,377	3,438,805	3,211,235
May	3,292,790	3,391,067	3,477,820	2,933,907
June	3,082,340	3,089,726	3,232,478	2,679,045
July	3,072,711	2,954,625	3,224,663	2,665,262
Aug.	3,136,995	2,950,674	3,200,723	2,707,171
Sept.	3,063,593	2,782,500	3,163,269	2,725,885
Oct.	3,334,024	2,812,015	3,334,206	3,017,883
Total 10 mos.	31,117,786	30,929,041	32,773,774	30,098,090
Nov.	.....	2,661,863	3,237,992	3,023,257
Dec.	.....	2,698,208	3,089,175	3,249,057
Total	.....	36,289,112	39,100,941	36,370,404

Rate of Operation

(Relation of Production to Capacity)

	1928†	1927*
Oct	79.3	64.5
Sept.	75.2	65.9
August	74.4	67.6
July	73.2	67.7
June	76.0	73.2
May	78.3	77.7
April	78.0	81.2
March	76.1	79.8
February	73.6	74.7
January	67.8	71.2
December	.....	61.8
November	.....	63.0

***Based on coke pig iron capacity of 51,379,400 gross tons as of Dec. 31, 1926. †Based on capacity of 49,605,720 tons as of Dec. 31, 1927. Capacities computed by American Iron and Steel institute.**

OCTOBER PIG IRON PRODUCTION

	No. in blast, last day of month		Total	
	Oct.	Sept.	Oct.	Sept.
Ohio	43	45	805,335	774,149
Pennsylvania	70	64	1,108,730	979,752
Alabama	19	20	221,134	195,453
New York	12	12	197,074	169,657
Illinois	15	16	332,938	306,674
Colorado	3	3		
Indiana	13	14		
Maryland	5	5	440,552	421,559
Virginia	1	1		
Wisconsin	0	0		
Kentucky	2	2		
Massachusetts	1	1		
Tennessee	1	2	121,370	117,180
Utah	1	1		
West Virginia	3	3		
Michigan	3	3		
Minnesota	2	2		
Missouri	0	0	74,261	66,924
New Jersey	0	0		
Texas	0	0		
Spiegel and ferro—all states	....	....	32,630	32,245
Total	194	194	3,334,024	3,063,593

Sheet and Tin Plate Mill Wages Unchanged

Youngstown, O., Oct. 30.—The bimonthly settlement of the Amalgamated association sheet wage base was made here today between Secretary Elias Jenkins, of the independent manufacturers, and officers of the Amalgamated Association of Iron, Steel and Tin Workers. The average sales price of Nos. 26, 27 and 28 gage black sheets in September and October was found to be 3.00c, the same as in the preceding two months, and therefore wages in the sheet mills will continue unchanged through November and December. Following are comparisons of price averages for the periods designated:

Sept.-Oct.	3.00c	unchanged
July-Aug.	3.00c	unchanged
May-June	3.00c	unchanged
March-April, 1928	3.00c	unchanged
Jan.-Feb.	3.00c	unchanged
Nov.-Dec.	3.00c	—3 per cent
Sept.-Oct.	3.10c	+3 per cent
July-Aug.	3.00c	unchanged
May-June	3.00c	unchanged
March-April, 1927	3.00c	—3 per cent
Jan.-Feb.	3.10c	—4½ per cent
Nov.-Dec.	3.25c	unchanged
Sept.-Oct.	3.25c	unchanged
July-Aug.	3.25c	unchanged
May-June	3.25c	unchanged
March-April	3.25c	+1½ per cent
Jan.-Feb., 1926	3.20c	+3 per cent

AVERAGE DAILY PRODUCTION

	1928	1927	1926	1925	1924
Jan.	92,113	100,043	107,039	108,781	97,278
Feb.	99,954	105,021	104,423	114,788	105,987
Mar.	103,199	112,326	111,554	115,207	111,787
Apr.	106,066	114,146	114,627	107,041	107,587
May	106,219	109,388	112,187	94,642	84,515
June	102,745	102,991	107,749	89,301	67,427
July	99,120	95,311	104,021	85,976	57,531
Aug.	101,193	95,183	103,249	87,328	60,741
Sept.	102,120	92,750	105,442	90,862	68,454
Oct.	107,549	90,710	107,555	97,351	79,419
Nov.	.....	88,728	107,933	100,775	83,832
Dec.	.....	87,039	99,651	104,808	95,367
Ave.	102,025	99,422	107,126	99,645	84,908

One of Sir Henry Bessemer's patents, in 1861, claimed the use of silicon to prevent blowholes in castings.

Industrial Men in the Day's News

Herbert Hoover, John Fritz Medalist For 1929

HIGHEST honor given by the engineering profession is won by Herbert Hoover for his distinguished achievements and public service.

BEGINNING his career in mines in the West, he has grown to be one of the best known men in the world through contacts made on numerous trips around the globe.

HE has honorary degrees from 36 universities, gold medals from leading institutions of all nations and is honorary citizen of several European countries.

HERBERT HOOVER, Engineer, Scholar, Organizer of Relief to War-Stricken Peoples, Public Servant" . . . thus is cited the man to whom the John Fritz medal for 1929 has been awarded by the Engineering Foundation, New York. In receiving the highest honor which can be won by those of the engineering profession Mr. Hoover joins the illustrious company of Lord Kelvin, George Westinghouse, Alexander Graham Bell, Thomas A. Edison, Elihu Thompson, Gen. George W. Goethals, Orville Wright, Sir Robert Hadfield and others.

Established in 1902, the John Fritz medal perpetuates the memory of that early stalwart of the American iron and steel industry who revolutionized blast furnace practice by greatly increasing the blast and gave impetus to the rolling mill industry by introducing three-high rolls. Notable scientific or industrial achievement is required of the recipient, who must have been under consideration for at least one year prior to receiving the award from a board of sixteen representing the American Society of Civil Engineers, American Institute of Mining Engineers, American Society of Mechanical Engineers and American Institute of Electrical Engineers.

Herbert Hoover, now the Republican party candidate for President, was born in Iowa in 1874. He was reared in Iowa and Oregon by relatives, having been orphaned at the age of 9, and attended night school, paying his own way from the time he was thirteen. He entered Leland Stanford university, studying mining and geology, and was graduated when 21. Mr. Hoover began his professional career in 1895 in the mines in California, Colorado and New Mexico, and two years later was sent to western Australia to examine mines which he later operated as general manager.

Seven times between 1898 and 1914 Mr. Hoover journeyed around the world on mining missions. Each of his trips was followed by a stream of orders for American mining machinery and calls for American engineers to assume important posts and install American methods.

Caught in London in 1914 in the maelstrom of war, Mr. Hoover promptly divorced himself from his mining interests and organized the Belgian relief. When the United States entered the war he was appointed food administrator, serving until June, 1919.

Named secretary of commerce in 1921 in the cabinet of the late President Harding, Mr. Hoover set about reorganizing the department. He successfully conducted the campaign for the elimination of waste, greatly broadened the work of the bureau of standards, co-operated with industry in a campaign of standardization, reorganized the bureau of foreign and domestic commerce, conducted the unemployment conference of 1921, placed the census bureau on a new basis and furthered the collection and dissemination of business statistics, helped trade associations over a trying period and co-operated with congress in setting up a commercial aviation division.

In addition to his post of secretary of commerce, which he resigned last summer, Mr. Hoover has been president of the American Child Health association and chairman of Better Homes in America. He is an hon-

orary member of nine engineering societies and clubs, is an honorary citizen of Belgium, Finland, Poland and Esthonia, has received honorary degrees from 36 universities and colleges and has been awarded gold medals from the leading institutions of all countries. His book "American Individualism," explains his philosophy. Mr. Hoover maintains residences at Palo Alto, Calif., and Washington.

Men of the Industry

WILLIAM McBRIDE, president of the Fort Pitt Spring & Mfg. Co., Pittsburgh, has resigned, effective Oct. 31. Mr. McBride has sold his interests to Pittsburgh, New York and Cleveland men.

WILLIAM M'BRIDE

He has been with the spring industry since 1906.

* * *

Dexter Tutein, formerly a member of E. Arthur Tutein Inc., and a well-known figure in the eastern pig iron business, has joined Harris Forbes & Co., brokers, New York.

* * *

Edward T. Monroe has been appointed general purchasing agent of the Buffalo, Rochester & Pittsburgh railroad, Rochester, N. Y., with headquarters in that city.

* * *

L. M. Mulholland, who has been general foreman for ten years of the American branch of the Holmes Foundry Co. Ltd., Port Huron, Ont., has been made Sarnia, Ont., plant manager, succeeding T. R. Berkeley.

* * *

Frank N. Speller, director of metallurgy and research of the National Tube Co., Pittsburgh, has been elected chairman of the metallurgical advisory board of Carnegie Institute of Technology, also in Pittsburgh.

* * *

R. J. McIntosh has been appointed manager of the steel piling department of the Bethlehem Steel Co., Bethlehem, Pa., in charge of engineering and sales, with offices at Bethlehem.

* * *

H. A. Schwartz, research director of the National Malleable & Steel Castings Co., Cleveland, presented "Some Theories of Graphitization," the American Foundrymen's association exchange paper before the Association Technique de Fonderie, in Paris.

* * *

Sidney J. Newman has been elected president of the Newman Mfg. Co., Cincinnati, succeeding Samuel Newman whose death was noted in IRON TRADE REVIEW, issue of Oct. 18. Walter J. Newman is vice president and Emil C. Newman, secretary and treasurer of the Newman company.

* * *

David Pollock of Mayer Pollock Co., Pottstown, Pa., has been elected president of the Reading, Pa., chapter of the Institute of Scrap Iron and Steel. Other officers are: First vice president, A. Sofranscy, H. Sofranscy, Allentown, Pa.; second vice president, Henry Weiner, Pottstown, Pa.; third vice president, Joel Claster, Luria Bros., Reading; secretary, S. Jacobson, Pear & Co., Reading; treasurer, Julius Caplan, Lebanon, Pa.

* * *

Hans P. Dahlstrand, chief engineer of the steam turbine department, Allis-Chalmers Mfg. Co., was elected president of the Engineers' Society of Milwaukee. Other new officers are: Vice president, William E. Crawford, A. O. Smith Corp.; secretary, H. W. Rohde; treasurer, Walter R. Mueller; directors, Joseph B. Armitage, chief mechanical engineer, Kearney & Trecker Corp.; C. T. Evans, Cutler-Hammer Mfg. Co.; L. H. Stark, and Robert Cramer, chief engineer Milwaukee sewerage commission.

* * *

C. F. Williams, sales manager for the Basic Products Co., Pittsburgh, for the past 10 years, has resigned to become associated with Ward & Shaw Co., Cleveland, commercial printers. Mr. Williams takes up his new work Nov. 1. Prior to his connection with the Basic company he

JOHN N. CRITCHLOW

Appointed general manager of sales of Oliver Iron & Steel Corp., Pittsburgh, as noted recently in Iron Trade Review

was for five years Pittsburgh editor for the Penton publications, including IRON TRADE REVIEW and *Daily Metal Trade*.

Hugh D. Largey, who has been Pittsburgh district sales manager for the Colonial Steel Co., succeeds Mr. Williams with the Basic company.

* * *

Robert J. Mullaly has been appointed sales manager for the Detroit district by the Youngstown Sheet & Tube Co., Youngstown, O. He succeeds Lew E. Wallace, who will be attached to the general offices at Youngstown as assistant manager of wrought pipe sales. Before going to Detroit two years ago, Mr. Wallace was in the sales offices of the company at Cleveland. Mr. Mullaly has been associated with the Youngstown company for many years, the past two in association with Mr. Wallace at Detroit.

Obituaries

JAMES A. SMITH, superintendent of the Schenectady, N. Y., plant of the General Electric Co. for the past 15 years, died Oct. 25. He was born in Hartford, Conn., May 25, 1873. Mr. Smith was employed by Pratt & Whitney in 1888 and later entered the apprentice shop of that company. For a while he was associated with the Niles-Bement-Pond Co., and later was superintendent of the Dutchess Tool Works, which position he held until going with the General Electric Co. in 1910.

* * *

W. L. Velie, 62, president of the Velie Motor Corp. and Velie Monocoupe Aircraft Corp., Moline, Ill., died Oct. 24. He was a grandson of John Deere, founder of Deere & Co.

* * *

John F. Lonergan, 88, for years head of the Lonergan Foundry & Machine Co., Philadelphia, died Oct. 23 at Sacramento, Calif. He was the inventor of several railroad devices which he manufactured in Philadelphia.

* * *

F. Birger Klein, 65, who for several years was in charge of research for the Union Switch & Signal Co., Swissvale, Pa., died Oct. 26 at his home in Wilkinsburg. He began with the Union Switch company when 23 and rose with its expansion until he was head of the research department.

Furnace and Coke Oven Problems Discussed

Important subjects in connection with blast furnace and by-product coke oven operation were presented for consideration of members of the Eastern States Blast Furnace and Coke Oven association at its fall meeting held Oct. 26 at the Shannopin Country club, Pittsburgh. About 75 members took part in the joint round table discussion held in the afternoon. A. E. Maccoun, superintendent blast furnaces, Edgar Thomson works, Carnegie Steel Co., Braddock, Pa., presided at the meeting.

Eight separate topics dealing with the efficiency of large blast furnaces, stock distribution, refractories, power, efficiency and available surplus in the blast furnace, were discussed. Following a dinner at 6:30 p. m. attended by more than 100 members, the meeting was given over to a discussion of stream pollution with special reference to coke plant wastes. B. W. Winship, coke oven superintendent, Steelton plant Bethlehem Steel Co. and president of the association, presided.

Talks were given by department of health representatives of various states, with special reference to the work of elimination of phenol discharges in river water. F. W. Speer, chief chemist, Koppers Co., Pittsburgh, and chairman of the committee on this subject, presented a report of his group's work. George E. Davis, coke oven superintendent, Hudson Valley Coke & Producers Corp., Troy, N. Y., spoke briefly on the phenol elimination work at the Hudson Valley plant.

President B. W. Winship announced that O. O. Mallias of the Koppers Co. has been named chairman of the committee on coke testing, succeeding J. W. Hacker, the Dyer Engineers Inc., Cleveland.

15 at Foreman Class

Indianapolis, Oct. 30.—Fifteen representatives of ten companies have registered for the foreman conference leader training, which was inaugurated Oct. 15. Some employers attended the opening class in order to observe how foremen are taught.

Steel Plate Is Lower

Washington, Oct. 30.—New orders for fabricated steel plate in September totaled 40,225 tons, making a 7000-ton drop from August, statistics of the department of commerce show. Monthly comparisons follow:

	*Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1926 (year)	513,913	175,367	47,524	14,406	196,849
1927					
Sept.	38,662	15,421	2,254	873	14,576
Total, 9 mos.	387,618	170,039	31,492	5,732	135,837
Oct.	47,090	18,648	3,252	385	11,599
Nov.	27,341	8,920	978	422	10,794
Dec.	35,648	13,367	3,490	385	13,088
Total (year)..	497,697	210,974	39,212	6,924	171,318
1928					
Jan.	35,787	8,758	2,062	1,225	16,412
Feb.	49,820	25,532	3,679	143	15,420
March	46,840	25,226	1,897	699	14,683
April	50,347	22,095	4,654	619	16,265
May	42,376	14,849	4,636	202	17,768
June	35,202	12,204	3,225	778	15,803
July	35,959	16,881	1,848	499	12,159
Aug.	47,245	24,807	1,814	429	17,579
Sept.	40,225	18,572	1,642	386	13,920
Total, 9 mos.	383,801	171,267	25,457	4,980	141,009

The airship GRAF ZEPPELIN on its recent voyage to this country brought 2200 invitations to prominent business men to attend the Leipzig Trade Fair in March, 1929. This fair has been held regularly for 700 years.

Pittsburgh Piping & Equipment Co. Celebrates Twenty-fifth Anniversary of Its Founding

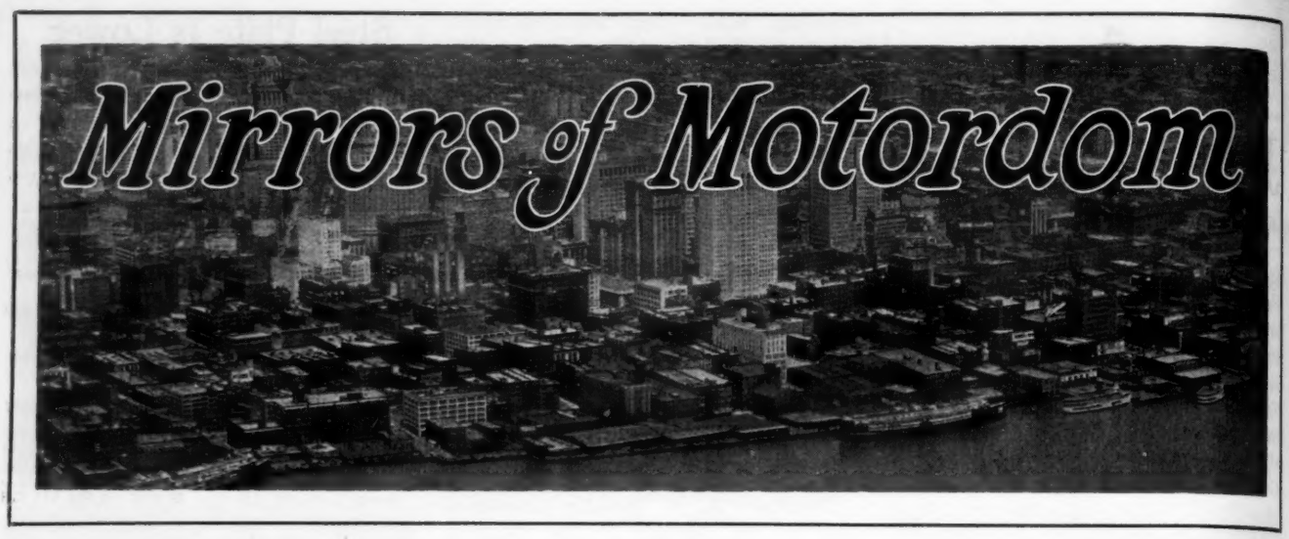
MARKING the completion of a quarter of a century of operation and expansion, the Pittsburgh Piping & Equipment Co., Pittsburgh, this year is celebrating the twenty-fifth anniversary of its founding. Since June, 1903, when three men launched the organization in business in a modest structure, 55 x 100 feet, built by their own employes, the company has grown steadily until today its plants occupy seven acres and the original 25 workers have been increased to 500. The $126,504 worth of business done in the first year compares with $2,500,000 annually today.

Founders of the Pittsburgh Piping & Equipment Co. were: President and general manager, George H. Danner; vice president, Joseph K. Smith; vice president and treasurer, Charles R. Rall. Mr. Smith died in March, 1918. Dr. Danner and Mr. Rall have continued up to the present in their original capacities. Louis K. Hamilton is secretary.

The company specializes in the furnishing and erecting of piping materials for various types of service, particularly public utility and industrial power plant installations. The growth of its business soon forced the company to expand its manufacturing facilities. The original plant has been supplemented by a main works on the bank of the Allegheny river, between Forty-first and Forty-third streets, Pittsburgh, where the general offices, fabricating plant, shipping department and part of the storage department are located. The foundry, with a monthly capacity of 1000 tons, occupies a group of buildings on a plot of three and one-half acres.

The company takes pride in the fact that 12 of the men who joined it at its inception in 1923 still remain with the organization, and to the co-operation of the workers is attributed much of the credit for the success which the company has had since its organization.

District sales offices and managers are as follows: Boston, Benjamin Mills Jr.; New York, D. G. Sinclair; Cleveland, A. T. Brodie; Detroit, G. H. Boddy; Indianapolis, G. W. Smith; Chicago, Berford Bittain; Dallas, Tex., W. K. Kirby; San Francisco, Oliver B. Lyman.



Chevrolet Deflection Exercises Minor Influence

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See Auto Steel Consumption Sustained Into 1929

Detroit, Oct. 30

DESPITE the absence of Chevrolet business since Oct. 6, steel sellers in the Detroit district report a sustained demand. With 1928 showing all signs of outdistancing any previous record in steel production, automobile manufacturers are getting ready to hang up their own new high record, with an output of 4,750,000 to 5,000,000 units. The outlook for the initial quarter of 1929 is entirely favorable. Steel specified for the last quarter so far is up to the third quarter rate and in spite of the approach of inventory taking time, Dec. 10 or Dec. 15, when many plants will be down, the trade is fully confident that the aggregate steel consumption for the quarter will be favorably comparable to that of the third quarter period.

All eyes are focused on the Chevrolet Motor Co., since the above output estimates are predicted not alone on Ford's gradual increase from month to month in his march toward a 10,000-daily goal, but on Chevrolet regaining its stride. The new 6-cylinder car is scheduled to make its public bow prior to the New York show—some say Nov. 15. Much equipment used in machining and forming motor blocks and other parts of the old 4-cylinder cars already has been melted up as scrap. In the meantime, almost as many men are occupied in its plants taking inventory, revamping motors, machinery, conveying equipment, etc., paving the way for the new model, as when last month it made 105,616 cars and trucks. This brought Chevrolet output for nine months of 1928 to 1,100,723 units, against 652,754 for the same period of 1927.

* * *

PURVEYORS supplying the Ford Motor Co. with steel, parts, castings, etc., have had their specifications stepped up at least 20 per cent within the past week. This has for its object a 6000-daily schedule. At present the average is 5500 to 5750. Along cost reduction lines, the malleable casting content of the model A has been augmented and now about 35 pounds per car is used as against 20 pounds two weeks ago and this week some malleable foundries are presenting additional sample castings made on patterns received late last week, to serve as further substitutes for drop forgings. As against 100,000 cars and trucks produced in September, the October schedule takes in 125,000 units. These figures are exclusive of Canadian production, now down to 450 or 500 cars per day, according to reliable information.

Henry Ford's assembly capacity for Stout tri-motored planes recently was augmented and now three instead of one per week are being built. Orders for 60 to 75 are booked ahead, the latest being an $800,000 order from the Pennsylvania railroad for 10.

* * *

PERHAPS 50 per cent of the car builders have their cars ready for the New York show. Several will slacken output to bring out new models. Cadillac-La Salle made 5000 cars in October compared with 5000 in September. Oakland-Pontiac increased from 19,113 in September to 22,000 in October. Chrysler-Plymouth-DeSoto will probably show a gain of 4000 units over the 33,000 for September, while Dodge has made at least 25,000 cars and trucks in October against 23,000 in September. Durant had a 10,000-schedule for October. In nine months Graham-Paige produced 65,486 cars or three times as many as in 1927, when 21,881 cars were built. Hudson-Essex were on the same basis this month as last, namely 20,000. On the other hand, Hupmobile is down from 6539 last month to a possible total of 5500 this month.

In connection with Chrysler-Dodge, some slackening of output may occur during the present quarter, since it is understood to be synchronizing its efforts and making certain parts on one car interchangeable with parts on the other.

* * *

TIMKEN ROLLER BEARING CO., Canton, O., delivering three carloads of bearings daily to the Ford plant, has received instructions to double this by Jan. 1. In this connection it has started a second building expansion program. It has to increase both its manufacturing and shipping facilities, present orders taxing present facilities beyond capacities. It recently purchased the Weldless Tube Co., Wooster, O., with a capacity of 4000 tons of cold drawn seamless tubing monthly for which an increasing outlet is found in the

(*Concluded on Page* 1158)

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

STOCKHAM PIPE & FITTING CO., Birmingham, Ala., has awarded contracts this week for a warehouse and shipping building and a laboratory. The contract is to the H. K. Ferguson Co., Cleveland. Construction is to be complete by Jan. 1. The warehouse and shipping building will be two stories, 104 x 251 feet, with a train shed for 10 cars and will be served by elevators. The laboratory will be one story, 60 x 95 feet. Herbert Stockham is president and L. N. Shannon is vice president and general manager.

* * *

C & G. COOPER CO., Mt. Vernon, O., has bought the manufacturing department of the Hope Engineering Co. of that city.

* * *

WILL-BURT Co., Orrville, O., is equipping a plant for the manufacture of an automatic coal burner for domestic use.

* * *

OHIO INJECTOR CO., Wadsworth, O., has opened a branch office at 908 Daniels building, Tulsa, Okla. E. C. Powell will be in charge of southwestern territory.

* * *

PROGRESSIVE BRASS MFG. CO., Tulsa, Okla., has moved from 917 East First street to 1702 East Sixth street to obtain larger facilities for manufacturing.

* * *

CLEVELAND CUTTER & REAMER CO., Cleveland, is building an addition to provide for increase in production and another addition for steel treating cutters and reamers.

* * *

DESPATCH OVEN CO., Minneapolis, has plans under way for a new plant for the manufacture of ovens for all purposes. The addition will practically double the present facilities.

* * *

ARTISAN METAL WORKS CO., Cleveland, will start manufacture at once of a telescopic truck and movable scaffold for use in interior erecting. The former line of gear and machine guards will be continued.

* * *

FEDERAL SCREW WORKS, Detroit, will take over the Chelsea Screw Co., Chelsea, Mich., maker of screw machine products. Stockholders of the latter have agreed to an exchange of stock.

* * *

NATIONAL CAST IRON PIPE CO., Birmingham, Ala., has bought the Alabama Cast Iron Pipe Co., Tarrant City, Ala., and will operate the plant of the latter at Tarrant City.

* * *

UNION MFG. CO., New Britain, Conn., has appointed E. M. Hanson & Co., 130 North Fourth street, Philadelphia, its sole distributor of chucks, chain hoists and trolleys in Philadelphia territory.

* * *

K & F. BRASS FOUNDRY, Orrville, O., manufacturer of brass, bronze and white metal products, has been bought out by H. E. Jenet and M. R. Jenet. Plans are under consideration for a new plant.

* * *

LYONS MACHINE CO., 5601 Tillman avenue, Cleveland, manufacturer of special machinery, jigs, tools and fixtures, is building an extension of its plant to double its production. A line of wall safes has been added to its products.

* * *

INDUSTRIAL SHEET METAL CO., Cleveland, recently incorporated, will manufacture and install dust collecting systems, ventilating devices and general sheet metal work. A. C. Wohlman is president, W. Chickering secretary and A. C. Salzer vice president.

* * *

STEBBINS-RICH BRASS MFG. CO., 6723 Denison avenue, Cleveland, manufacturer of copper joint couplings and brass goods, will start production about Nov. 15. E. S. Stebbins is president and general manager, N. J. Rich vice president, and J. Simon secretary and treasurer.

* * *

CARNEY & LINDEMUTH, 40 Wall street, New York, engineering and patent work in iron and steel, have dissolved and L. B. Lindemuth has opened temporary offices at 29 West Thirty-ninth street and will continue as consultant on steelworks operations. He will establish offices Jan. 1 in the new Chanin building at Lexington avenue and Forty-second street. Frank D. Carney will continue at 40 Wall street, specializing in patent work for the steel industry.

* * *

TORIDHEET CORP., Cleveland, recently incorporated, is a division of the Cleveland Steel Products Corp., Madison avenue and West Seventy-fourth street. F. C. Hipp is president, W. J. Smith vice president and general manager, E. R. Seager secretary and H. F. Braun works manager. The new company will manufacture oil burners.

* * *

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., has been awarded the contract for the complete electrical equipment of a double-ended ferry for the San Diego-Coronado Ferry Co. The craft will be built by the Moore Drydock Co., San Francisco. It will be driven by two main diesel engine generator units and two propulsion motors of 750 horsepower each. This is the ninth Pacific coast ferry the Westinghouse company has equipped electrically.

* * *

GENERAL FOUNDRY & MACHINE CO., Flint, Mich., has been organized to acquire assets of the Flint Foundry Co., General Foundries and the Flint Malleable Castings Co., all of Flint. The Flint Malleable Castings Co. also operates a plant at Marshall, Mich., which will be a part of the new consolidation. In addition to gray iron and malleable castings, the General Foundry & Machine Co. will add finishing shop operations to take care of galvanizing, machining and other finishing. J. M. Barringer is president of the new consolidation.

* * *

IDEAL POWER LAWN MOWER CO, Lansing, Mich., has elected Clarence S. Roe, former treasurer, as president, succeeding Charles Ecker, who will remain with the company as counsel. Charles Smith, former secretary, has been made vice president and general manager; D. R. Hoadley, former comptroller, has been made secretary, and William I. Austin, former assistant sales manager, has been advanced to sales manager. Miss M. U. Flannigan has been elected assistant secretary and treasurer, F. M. Seeley,

chief engineer, and John C. Carr, auditor.

* * *

MANRY IRON WORKS, Thomasville, Ga., has changed its name to the Manry Foundry & Machine Works. The company recently has built an addition to be used as a foundry.

* * *

CONRAD FOUNDRY CO., Montgomery street, Elizabeth, N. J., gray iron and aluminum castings, has been bought by the Ware & Leonard Foundry Co., which will operate the plant.

* * *

GREAT LAKES AIRCRAFT CORP. has been formed to take over the airplane plant of the Glenn L. Martin Co., Cleveland, for the manufacture of airplanes for commercial use. The Martin company is building a plant at Baltimore to build planes for government use. William Robert Wilson, president of the Guardian Trust Co., Detroit, is chairman of the board of the new company.

* * *

McCLINTIC-MARSHALL CONSTRUCTION CO., Pittsburgh, has acquired the bridge works of the Bethlehem Steel Co. at Bell and Abbey streets, Buffalo. A subsidiary known as the McClintic-Marshall Construction Co. will operate the plant. It will have 5000 shares of stock of no par. Possession was given Nov. 1. This plant formerly was that of the Lackawanna Bridge Co., having been taken over by Bethlehem with its purchase of the Lackawanna Steel Co.

* * *

YOUNGSTOWN SHEET & TUBE CO. and Youngstown Steel Products Co. have established Michigan headquarters in room 713 of the new Fisher building, West Grand boulevard, Detroit. The General Cable Corp., comprising the A. A. Wire Co., the American Insulated Wire & Cable Co., Safety Cable Co., Phillips Wire Co. and Detroit Insulated Wire Co., are now located at 1016-1018 in this building. Others to open offices in it are the Aluminum Industries Inc., 718; Automatic Sprinkler Corp., 1004; Automotive Materials Corp., 23rd floor; and Cadillac Machinery Co., 414.

* * *

GEARS & FORGINGS INC., Cleveland, has taken a contract for supplying part of the equipment for the Arlington memorial bridge across the Potomac river at Washington. This company also has been given a contract by the Phoenix Bridge Co., Phoenixville, Pa., for complete operating machinery and mechanical parts for a double-leaf bascule bridge. A contract with the Vincennes Bridge Co., Vincennes, Ind., includes complete operating machinery for two double, leaf bascule bridges, at New York and Wilmington, N. C. Gears & Forgings Inc., has recently moved into its new office building at 3010 Woodhill road, Cleveland. An addition at Cleveland is being started.

Mirrors of Motordom

(*Concluded from Page* 1156)

greater Detroit area. The company also operates a seamless mill at Canton, O.

* * *

PACKARD MOTOR CO., which produced 5000 cars in September and maintained that ratio in October is unable to meet the demand. It is concentrating on 8-cylinder cars, and shipments for the first nine months totaled 37,033, an increase of 53 per cent over the same period of 1927. During the past year much material used was made instead of being purchased outside. Export business increased 65 per cent.

Packard recently concluded successful tests on an airplane motor of the diesel type, utilizing oil for fuel. The motor weighs less than 3 pounds per horsepower produced as compared with 100 pounds per horsepower the lowest point previously achieved in this type. This motor, of the radial air-cooled type was designed by Capt. L. M. Woolson, of Detroit.

Bethlehem Third Quarter Earnings Declined

New York, Oct. 30.—Bethlehem Steel Co. is setting production records this month, according to E. G. Grace, president. Its production is at the rate of 94 per cent of ingot capacity. Unfilled orders at the end of the third quarter were around 634,000 tons, a gain of about 100,000 tons during the quarter, and a gain of more than 200,000 tons as compared with a year ago. Billing prices during the third quarter were substantially the same as during the preceding quarter. The recent increase in prices for finished steel will not be reflected in earnings until the report for fourth quarter is compiled. Mr. Grace expressed satisfaction with present steel prices; he said they certainly were not too high from the steel mill standpoint, but ought to return a fair profit to them.

Third quarter earnings, after deducting all charges and dividends on the preferred stock, were equal to $1.43 per share on the common stock as compared with $1.57 per share in the second quarter of 1928 and $.61 per share in the third quarter of 1927. Total earnings for the first nine months of 1928 were $3.94 per share as compared with $4.65 for the first nine months of 1927.

Operations averaged 82.3 per cent in the third quarter, compared with 82.5 during the preceding quarter and 69.3 per cent during the third quarter of 1927.

Good demand for steel continues from all consuming industries, said Mr. Grace, the only weak factor being the absence of demand for railroad equipment. But there are indications of an early improvement in that direction. He said that Bethlehem's privately owned cars are in great demand by the various railroads, indicating that there is a real need for more rolling stock.

The company's earnings were shown as follows, compared with previous quarters:

	Third quarter 1928	Second quarter 1928	Third quarter 1927
Total income of Corp. and subsidiary companies	$10,491,832	$10,767,959	$8,920,716
Int. charges.....	2,809,675	2,841,636	2,857,318
Balance	$7,682,157	$7,926,323	$6,063,398
Provision for depletion, depreciation and obsolescence....	$3,409,629	$3,396,995	$3,275,345
Net income..	$4,272,528	$4,529,328	$2,788,053
Dividends:			
Pfd. stock....	$1,697,500	$1,697,500	$1,697,500
Com. stock...	.....	.....	.....
Total	$1,697,500	$1,697,500	$1,697,500
Surplus	$2,575,028	$2,831,828	$1,090,553

Malleable Castings Off

Washington, Oct. 30.—Production of malleable castings declined in September, department of commerce figures show. Monthly comparisons follow:

	Total tons produced	Per cent of capacity	Total tons booked	†Monthly capacity
1926 715,384		54.7	607,949	1,307,889
1927				
September.. 45,210		43.3	37,912	104,401
9 mos 495,902		52.1	440,825	950,780
October 46,765		46.0	39,494	101,606
November.... 40,845		40.5	34,624	100,778
December.... 47,876		47.6	49,215	100,685
Year 631,388		50.4	564,158	1,253,849
1928				
January 54,818		59.6	53,153	92,015
February .. 59,045		63.8	55,452	92,498
March 63,322		69.6	60,697	91,043
April 56,880		62.5	53,099	91,019
May 61,458		67.3	54,429	91,296
June 60,779		66.6	51,388	91,259
July 54,373		59.9	52,128	90,759
August 61,833		68.5	56,415	90,311
September .. 56,650		63.2	55,278	89,696
9 mos. 529,158		64.5	492,039	819,896

†Capacity during 1927 has been based on following formula: "Total number of units of molding floor space times average production per molder per day per unit of floor space, times number of actual working days per month." Beginning January, 1928: "Average monthly production for the best six consecutive months since Jan. 1, 1919, is to be taken as a practical monthly capacity."

*Revised.

Arkansas coal miners in 1927 averaged 137 days' work, in Kentucky 235 days and in Oklahoma 197 days.

Friction Saw Is Used To Cut Rail Lengthwise

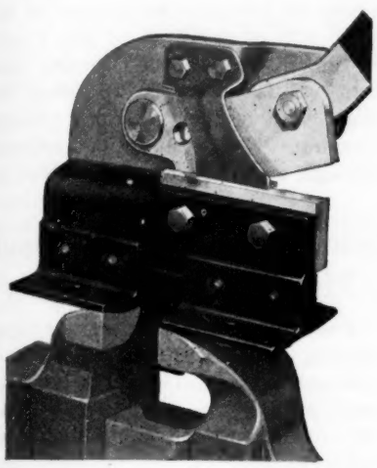
(*Continued from Page* 1125)

trolley poles are used so that the machine itself is not used as a return for the motor current. Five individual air clamps hold the rails which are to be cut. These clamps are powerful enough to straighten the rail during the time of cutting, thus removing some of the camber ordinarily found in most rails.

Portable Slitting Shear Mountable in Vise

No. 270

National Machine Tool Co., 1536 Clark street, Racine, Wis., has placed on the market a new portable slitting shear which can be mounted in a vise or on a bench. Vise mounting



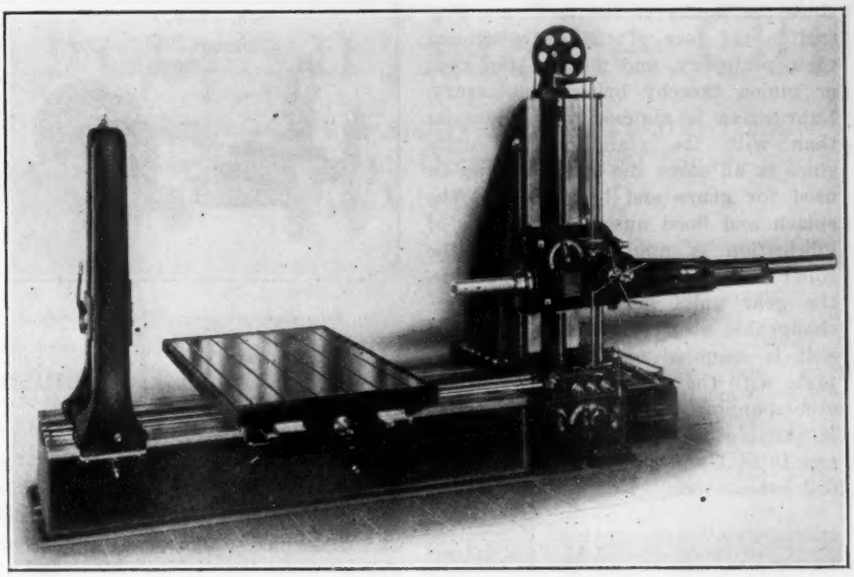
No. 270—Shear mounted in vise

is accomplished by forcing the vise against a tapered latch which protrudes from the base of the shear as shown in the accompanying illustration. The latch may be swung up out of the way if it is desired to mount the shear on a bench. Capacity of the shear is ⅛-inch flat steel stock or $\frac{3}{16}$ x 2-inch bars. An attachment is available for cutting rods up to 5/16-inch in diameter. Shear blades are made of a high-grade tool steel and are removable for sharpening. Net weight of the shear is 15 pounds.

Increased Range on New Milling Machine

No. 271

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., recently has placed on the market a table-type horizontal boring, drilling and milling machine, developed to meet an increasing demand for the precision and production possibilities of a table-type machine on large and heavy work. To properly distribute the loads in the handling of large work the bed is of massive box-type construction, as shown in the accompanying illustration. The ways are 13 inches wide, relieved in the center, and 48 inches over the outer edges. The column is a heavy box section ribbed in both directions, the base being 40 inches square. For adjustment between the table and saddle two taper gibs are provided, one at each end. The screw for cross feed of the table is mounted on ball bearings and arranged with adjustable graduated dials on either end. Speeds and feeds are through sliding gears and jaw clutches in separate units mounted on the bed of the machine and running in oil. Changes in speed and feed are accomplished through levers accessible from the normal operating position. Power to the machine is furnished through two twin-disk friction clutches. A gear change quadrant is included in the feed gear train.

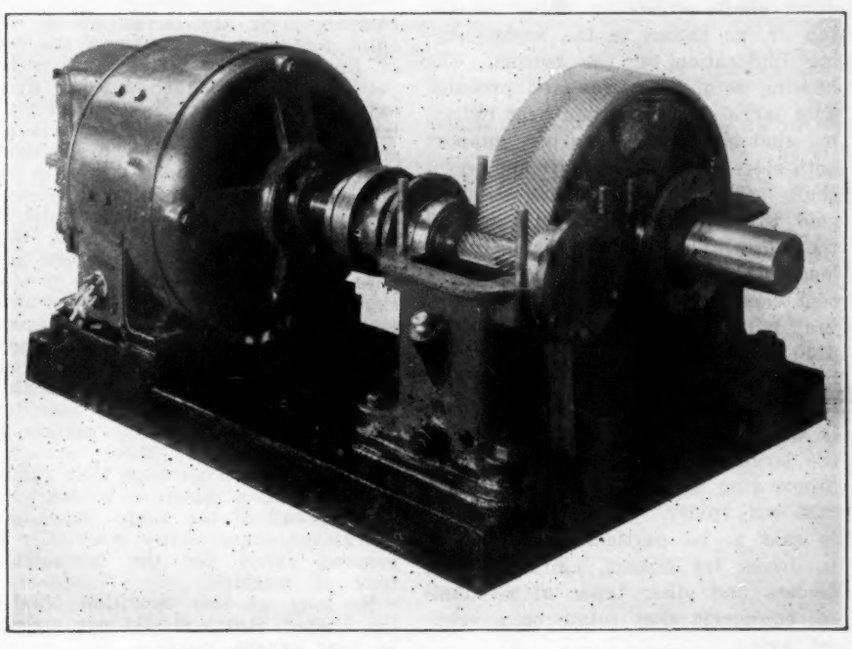


No. 271—Horizontal boring, drilling and milling machine

Improves Bearing Design of Speed Reducers

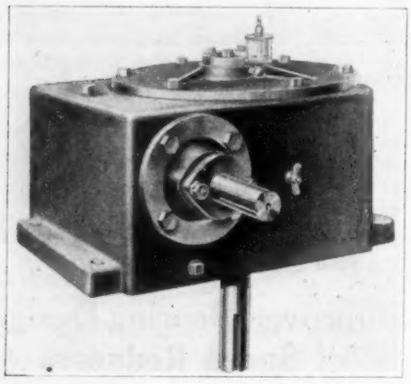
No. 272

Farrel-Birmingham Co. Inc., 344 Vulcan street, Buffalo, has developed a new and complete series of speed reducers with continuous tooth herringbone gears generated by the Sykes process. The reducers are equipped with roller bearings of the type which combine journal and thrust capacity; pinion and gear shafts are held from end float. This type of mounting is said to be applicable with the Sykes gears



No. 272—Single reduction speed reducing unit

since the apices of the teeth are central in the face of the gears around their periphery, end float of the gear or pinion thereby being unnecessary. Lubrication is claimed to be simpler than with the plain bearing units since in all cases the same oil may be used for gears and bearings and the splash and flood automatic system of lubrication is applicable. Since the roller bearings are interchangeable, the gear units may be made interchangeable also. The single reduction unit is mounted on a common baseplate with the motor, as shown in the accompanying illustration. This series is suitable for ratios between 2 to 1 and 10 to 1 and powers between 3 and 300 horsepower.

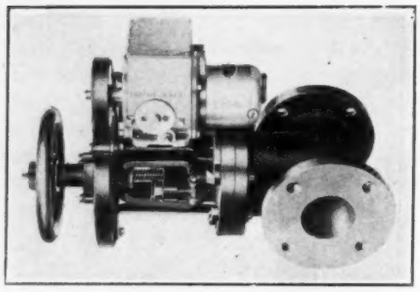


No. 273—Worm gear speed reducer

Announces Heavy Duty Speed Reducer

No. 273

D. O. James Mfg. Co., 1120 West Monroe street, Chicago, announces an improved vertical-type worm gear speed reducer that is made to allow for vertical driving with the drive shaft projecting either at the top or, as shown in the accompanying illustration, at the bottom. The housing is of gray iron and provided with large oil cooling and heat radiating chamber. Roller bearings support both sides of the gear shaft and worm shaft. This bearing arrangement is said to insure proper operation and the absorption of radial and thrust loads. Gear shafts are of 0.40 per cent carbon steel and are made integral with worm shafts of S. A. E. 3140 chrome nickel steel, generated, heat treated, ground and fully relieved. High-grade phosphor bronze is used in the fabrication of gears, the larger sizes being made up of a bronze ring shrunk on and keyed to a cast-iron spider. The speed reducer is said to be particularly applicable to drives for mixers, agitators, disk feeders and other types of mechanical equipment that rotate on a vertical axis.



No. 274—Motor-driven valve

Motor Driven Mechanism Operates Valves

No. 274

Cutler-Hammer Mfg. Co., Twelfth street and St. Paul avenue, Milwaukee, recently has introduced a motor-driven valve operating unit which is claimed to make possible the automatic operation of valves up to 6 inches in size. Although the device was designed primarily for valve operating service in industries where regulation of pressures and temperatures of gases and fluids is necessary, the unit is said to be applicable likewise to many miscellaneous applications. As shown in the accompanying illustration, the mechanism is small in size; its rating is 15 foot pounds. Automatic operation is possible by means of float switches, temperature controlling devices and pressure regulators.

America Gets Most from Machine Tools

(*Concluded from Page* 1124)

ing ice water. It is part of the American spirit."

Germany offers another interesting comparison in the utilization of machine tool equipment. As in the case of England, mass production has not yet been accomplished to any great extent. Individual shops are not large and the volume of work is not sufficient to occupy the productivity of single-purpose tools. Only in the largest of German plants is there a demand for the single-duty units so common in the United States. Germany's chief need is for general-purpose machinery. Further, the smaller shops are asking for combination tools which will accommodate several types of operations, for example, units which will perform drilling, milling and boring, etc. Thus with a small capital outlay, the manufacturer is equipped for a variety of work. In America, there are few shops of any importance that cannot afford a half a dozen or so machines to cover all of the simple machining operations, consequently practically no demand exists for the combination type of machine.

So long as this condition obtains, the United States should not seriously fear severe machine tool competition from this source in spite of the fact that the exchange rate is most favorable to the European nation.

Foreign Scientists To Attend Conference

More than 100 speakers representing 12 countries are listed tentatively to present papers at the second International Conference on Bituminous Coal to be held under the auspices of the Carnegie Institute of Technology, Pittsburgh, Nov. 19-24. Subjects to be discussed will include the following: Pulverized fuel; gas production; liquefaction and hydrogenation; fertilizers; coal classification; high temperature carbonization; combustion in furnaces; coal purification and cleaning; tars and oils; and low temperature processes. The list of speakers includes many of the world's leading authorities on the latest developments in improved utilization of coal as a source of energy. An address of welcome will be delivered by Dr. Thomas S. Baker, president of Carnegie Institute of Technology. Technical sessions will be held starting Monday morning, Nov. 19 and continuing through Saturday afternoon, Nov. 24.

Societies Will Sponsor Midwest Power Show

The fourth Midwest Power Engineering Conference will be held in Chicago, Feb. 12-15 under the sponsorship of the local sections and regional divisions of nine national technical societies. Official hotel headquarters will be at the Palmer House. Already several sessions have been planned covering specialized activities such as heating, refrigerating, mining, electrical transmission and application, ventilating and coal utilization. In connection with the conference the fourth Chicago Power Exhibition will take place in the Coliseum at Chicago. Operating exhibits will occupy a major portion of this display.

1929 Meeting Announced

Dr. W. Lash Miller of the University of Toronto, Toronto, Canada, is chairman of the local committee for the first 1929 meeting of the American Electrochemical society, to be held in Toronto, May 27-29. The main symposium subject of the convention will be "Electromagnetic Characteristics of Electrochemical Processes."

Revised government figures place Kentucky's 1927 coal production at 67,579,996 tons.

September Foreign Trade Off

Fails to Maintain Record Level Established in August—Exports Totaling 228,056 Tons, Drop 60,000 Tons, to Lowest Mark Since April—Imports Decline to 57,782 Tons—Nearly All Classifications Show Losses—Average Daily Movement Down

UNABLE to maintain the record level established in August, iron and steel foreign trade of the United States in September declined to a marked degree, according to the iron and steel division of the department of commerce. Exports, decreasing 60,000 tons to 228,056 tons, were at the lowest mark since April.

IMPORTS AND EXPORTS

Gross Tons

	—1928—		—1927—	
	Imports	Exports	Imports	Exports
Jan.	58,635	205,766	63,404	215,235
Feb.	47,626	185,915	49,451	166,128
March	74,128	221,935	61,872	171,094
April	71,579	215,184	60,374	192,339
May	72,106	267,890	79,814	202,708
June	65,819	262,052	69,017	184,364
July	47,830	253,336	61,112	190,502
Aug.	69,914	287,297	68,386	175,636
Sept.	57,782	228,056	58,464	166,352
(9 mos.)	565,421	2,127,431	571,413	1,665,864
Oct	.....	.....	52,503	170,255
Nov.	.....	.....	61,882	177,928
Dec.	.....	.....	64,188	168,428
Total	.....	.....	750,467	2,180,969

The drop in imports, from 69,914 tons in August to 57,782 tons in September, was not as great as that in exports. Even though exports registered a loss, the cumulative 9-month total was not materially affected and at the present time the 1928 figure lacks just 55,760 tons of equaling the total export trade for all 1927.

The average daily export movement during September was 7602 tons, distinctly below the August mark of 9268 tons. September average daily import movement was 1926 tons, also declined.

While the loss in exports was noticed in practically all of the 39 classifications into which it is divided it was furthered by large declines in boiler tube and welded pipe and scrap. The former declined 14,038 tons in September and the latter 12,027 tons. Rail, black steel sheet and tin plate losses were also fairly large. Eight classifications of exports showed increases. Fifteen of the 27 groups into which imports are divided reflected the decline of imports, with structural shapes losing 6877 tons, cast iron pipe 4510 tons, and pig iron 2553 tons.

Scrap was the principal product in the September export trade and the largest shipment of it went to Canada. Japan was second in receiving tonnage of this classification. Ingots, blooms, billets and skelp made up the second largest tonnage.

Belgium was not displaced in its leadership in American import trade in September, sending a total of 16,552 tons of iron and steel products slightly lower than in August. German shipments were second and Canadian third in September.

Cumulative shipments from Belgium for the nine-month period of 1928 was about 7000 tons behind the cor-

ORIGIN OF PIG IRON IMPORTS

Gross Tons

From	Sept.	Aug.
Mexico	32	32
Netherlands	4,159	1,833
Norway	263	321
United Kingdom	2,225	2,550
British India	3,758	7,495
Sweden	.....	759
Totals	10,437	12,990

ORIGIN OF IRON ORE IMPORTS

Gross Tons

From	Sept.	Aug.
Spain	5,461	544
United Kingdom	10	.....
Canada	167	870
Cuba	31,000	33,500
Chile	130,800	130,800
Algeria and Tunis	27,525	52,474
Newfoundland	10,030	.....
Australia	6.501	.....
Egypt	.....	6,800
Totals	211,494	225,538

ORIGIN OF MANGANESE IMPORTS

Gross Tons

From	Sept.	Aug.
Turkey-in-Europe	4,232	.....
Canada	18	67
Brazil	2,162	3,132
British India	3,780	2,260
British West Africa	4,768	2,358
Germany	.....	6
Soviet Russia in Europe	.....	14,729
Chile	.....	2,430
Totals	14,960	25,996

ORIGIN OF FERROMANGANESE IMPORTS

(Concentrates)

Gross Tons

From	Sept.	Aug.
France	35	47
Norway	3,092	1,188
United Kingdom	462	919
Italy	24	24
Canada	1,047	543
Totals	4,660	2,721

ORIGIN OF IMPORTS

Gross Tons

From	Steel bars	Cast iron pipe	Steel scrap	Ingots, blooms, etc.
Belgium	4,391	818	.....	947
France	1,157	946	13	829
Germany	833	.....	32	135
Netherlands	16	.....	.....	.....
Sweden	774	.....	114	267
United Kingdom	146	.....	5	12
Canada	4	14	5,563	3
Austria	17	.....	.....	.....
Czechoslovakia	12	.....	.....	.....
Norway	8	.....	.....	.....
Totals	7,358	1,778	5,727	2,193

IMPORTS OF IRON AND STEEL

Gross Tons

Item:	Sept. 1928	Aug. 1928	January through Sept. 1928	1927
Pig iron	10,437	12,990	104,777	93,949
Ferromanganese and alloys (1)	4,660	2,721	34,677	21,111
Ferrosilicon (2)	123	416	2,963	6,563
Ferrochrome (3)	79	94	570	412
Scrap	5,727	5,394	37,650	45,165
Iron slabs	....	....	4	....
Steel ingots, blooms, billets, etc.	2,193	1,338	16,614	9,419
Steel bars	7,358	8,270	70,932	72,466
Iron bars	161	67	1,613	3,164
Wire rods	1,076	1,042	12,130	11,415
Hoops, bands, and scrolls	1,944	2,176	15,543	26,449
Boiler and other plate	606	707	4,668	3,248
Sheets, skelp and saw plate	2,347	1,566	19,912	11,939
Tin plate	34	32	817	980
Structural shapes	12,207	19,084	131,169	119,660
Rails and splice bars	891	911	12,982	14,620
Cast iron pipe	1,778	6,288	47,314	69,345
Other pipe and tubes	3,084	4,456	31,513	43,206
Barbed wire	762	384	3,121	3,486
Round iron and steel wire	378	412	3,220	3,171
Steel telegraph and telephone wire	....	15	178	32
Flat wire and strip steel	217	224	1,735	1,974
Wire rope and strand	98	186	1,255	1,799
Other wire	78	53	451	467
Nails, tacks and staples	1,365	894	7,122	4,921
Bolts, nuts, rivets and washers	16	6	176	289
Castings and forgings	163	188	2,315	2,163
Total	57,782	69,914	565,421	571,413

(1) Manganese content.
(2) Silicon content.
(3) Chromium content.

IMPORTS BY COUNTRIES OF ORIGIN

Gross Tons

	Sept. 1928	January through Sept. 1928	1927
Austria	19	299	744
Belgium	16,552	151,724	158,399
Czechoslovakia	276	1,256	4,517
France	5,414	96,859	101,755
Netherlands	4,457	24,857	22,195
United Kingdom	4,191	68,658	42,505
Germany	9,743	87,603	104,999
Italy	24	460	305
Norway	3,366	9,615	7,039
Sweden	2,305	20,998	16,642
Switzerland	1	44	25
Canada	7,629	54,987	57,277
Mexico	32	451	235
British India	3,758	38,327	36,664
Japan	15	80	22
Poland and Danzig	.....	3,731	5,010
China	.....	4	.....
Denmark	.....	205	108
Hungary	.....	141	.....
Spain	.....	197	30
Cuba	.....	15	2,189
Dominican Republic	.....	806	.....
Ecuador	.....	700	.....
Virgin Is. of U. S.	.....	3	31
Syria	.....	13	.....
New Zealand	.....	2,001	.....
Morocco	.....	5	.....
Panama	.....	381	19
Jamaica	.....	628	.....
Other countries	.....	.....	225
Totals	57,782	565,421	571,413

responding time last year. France and Germany both show losses in the cumulative totals for 1928 compared with 1927.

The largest shipment of tin and terne plate was made to Japan. That country also received a good sized tonnage of steel rails. Out of the shipment of galvanized sheets totaling 8701 tons, Canada received 2449 tons. Dutch East Indies was second.

EXPORTS OF IRON AND STEEL

Gross Tons

Item:	Sept. 1928	Aug. 1928	January through Sept. 1928	1927
Pig iron, not including ferro-alloys	10,228	8,404	52,559	35,088
Ferromanganese and spiegeleisen	1,253	1,041	8,292	534
Scrap	58,511	70,538	423,287	175,824
Ingots, blooms, skelp, etc	17,059	16,400	106,409	70,723
Iron bars	453	180	2,922	3,482
Steel bars	11,785	12,517	108,969	83,294
Alloy steel bars	1,282	1,231	11,107	4,028
Wire rods	2,824	3,620	28,561	11,784
Plates	10,989	12,199	109,562	103,726
Galvanized sheets	8,701	13,581	112,699	122,440
Black steel sheets	12,038	19,069	140,568	125,874
Black iron sheets	1,285	1,297	11,425	12,830
Hoops, bands and strip steel	4,249	5,121	42,055	33,280
Tin plate, terneplate, etc	16,471	22,374	185,472	201,973
Structural shapes, plain material	13,377	14,333	132,092	106,818
Structural materials, fabricated	4,272	6,716	67,438	49,533
Metal lath	543	581	4,007	3,533
Steel rails	16,466	23,999	161,130	137,076
Rail fastenings, switches, frogs, etc	1,518	2,681	34,260	25,311
Boiler tubes and welded pipe	16,056	30,094	184,510	199,285
Malleable iron screwed pipe fittings	935	854	8,756	7,502
Cast iron screwed pipe fittings	355	654	4,710	5,372
Cast iron pressure pipe and fittings	450	501	8,335	8,212
Cast iron soil pipe and fittings	1,397	1,843	12,050	6,457
Plain wire	3,069	3,867	33,902	25,838
Barbed wire and and woven wire fencing	4,634	5,494	54,097	38,609
Wire cloth and screening	101	235	1,398	1,755
Wire rope	376	509	3,849	3,391
Insulated wire and cable	26	27	425	393
Other wire and manufactures of	1,113	641	7,388	7,509
Wire nails	791	905	11,728	6,595
Nails, other than wire	421	680	6,749	5,598
Tacks	39	74	567	713
Horseshoes	34	37	340	394
Bolts, nuts, rivets, except track	916	1,038	9,716	9,020
Car wheels and axles	2,345	1,494	12,407	13,828
Iron castings	545	643	8,350	8,752
Steel castings	379	507	7,223	5,722
Forgings	770	1,318	8,117	3,768
Total	228,056	287,297	2,127,431	1,665,864

DESTINATION OF EXPORTS

Gross Tons

Country of destination	September 1928	January through September 1928	1927
N. and Cent. America and W. Indies	138,310	1,026,898	827,072
Canada and Newfoundland	126,131	857,288	632,474
Cuba	3,709	47,262	72,983
Mexico	5,593	61,140	64,164
Guatemala	121	6,418	5,356
Panama	626	11,649	14,992
Salvador	243	2,645	3,293
British W. Indies	323	5,920	10,134
Other W. Indies	823	22,785	14,037
Other Central America	741	11,791	9,639
South America	20,942	323,325	269,623
Argentina	5,169	72,159	62,637
Brazil	1,190	60,653	54,539
Chile	3,071	52,771	33,038
Colombia	3,328	49,068	43,677
Peru	3,638	19,149	27,078
Uruguay	377	6,762	8,488
Venezuela	4,084	58,986	38,042
Other S. America	85	3,777	2,124
Europe	9,188	234,453	157,408
Belgium	1,409	12,175	3,872
France	629	3,832	4,151
Greece	14	1,907	2,563
Italy	2,030	81,613	39,960
Netherlands	168	1,703	2,300
Russia	23	2,607	5,744
United Kingdom	3,666	39,074	53,661
Other Europe	1,249	91,542	45,157
Far East	59,097	532,564	398,394
British Malaya	661	5,454	6,820
China	7,171	76,886	42,233
Dutch E. Indies	5,981	30,450	27,986
India and Ceylon	537	18,657	22,536
Japan and Chosen	36,376	298,019	206,826
Kwangtung	3,308	12,356	16,416
Philippine Islands	3,463	64,527	45,945
Australia	1,301	12,243	20,299
New Zealand	372	1,801	839
Other Asia and Far Eastern markets	827	12,171	8,494
Africa	519	10,191	13,367
British South Africa (Union of)	401	4,402	6,129
Egypt	11	3,425	3,041
Mozambique	93	1,006	3,367
Other Africa	14	1,358	830

DESTINATION OF SEPTEMBER IRON AND STEEL EXPORTS

Gross Tons

	Rails	Galvanized sheets	Plates not fabricated	Tin, terne plate	Steel sheets black	Barbed wire	Steel bars	Steel scrap
Argentina		370		386		1,636		
Australia		24	43		113			
Belgium								
Brazil		148	3	227		392	4	
British India		8						
British Malaya				421				
British S. Africa		51				125		
Central America		514	77		12	175	213	
Chile	121	6	28	426	1,483			
Canada	4,548	2,449	9,034	4,344	6,694	78	9,392	44,092
China	4,321	240		798			130	446
Colombia		546	1	6		467		
Cuba		254	56	238		462	215	
Dutch E. Ind.		914						
Dutch W. Ind.	4			39				65
Europe			9		492			
Other Europe		411		154				
Germany								
Hong Kong								93
Italy				56				326
Japan	3,190	599		6,888	2,137		82	1,765
Java and Madura				270				11,279
Kwantung	2,013							
Mexico	276	675	71	761	198	230	63	9
New Zealand								435
Norway		5						1
Peru	1,140			962	30		18	
Philippine Islands	85			253	326	118	151	
United Kingdom					145		1,042	
Uruguay				60				
Venezuela	1			31				
	16,466	8,701	10,405	16,471	12,038	4,370	11,785	58,511

Massachusetts Institute of Technology, Cambridge, Mass., has published number 2 of the 1928 series of abstracts of scientific and technical publications of this institution. The booklet contains 72 pages. Abstracts of theses presented for doctors' degrees are included also.

Exports of Metalworking Machinery

(In number except where otherwise specified)

	September 1928	September 1927	January through September 1928	1927
Engine lathes	56	38	611	424
Turret lathes	14	15	316	198
Other lathes	46	25	593	319
Vertical boring mills and chucking machinery	6	11	84	88
Thread-cutting and automatic screw machines	47	47	614	618
Knee and column type milling machines	26	5	259	150
Other milling machines	37	37	529	295
Gear-cutting machines	23	29	298	297
Vertical drilling machines	19	15	432	195
Radial drilling machines	14	8	114	64
Other drilling machines	75	192	964	1,146
Planers and shapers	25	29	327	303
External cylindrical grinding machines	73	66	724	502
Internal grinding machines	27	46	370	332
Metalworking tool-sharpening machines	65	37	504	556
Other metal-grinding machines, pounds	61,722	70,625	1,285,670	874,175
Sheet and plate metalworking machines, pounds	2,257,618	461,972	8,500,292	4,282,893
Forging machinery, pounds	287,033	576,824	2,786,404	3,388,774
Rolling-mill machinery, pounds	733,800	689,896	6,923,396	5,945,478
Foundry and molding equipment, pounds	2,039,904	581,567	9,607,869	4,582,953
Other power-driven metalworking machinery and parts, pounds	511,173		6,615,609	
Pneumatic portable tools	1,018	1,227	14,487	14,272
Other portable and hand or foot operated metalworking machines and parts, pounds	48,855	32,873	729,268	462,894
Chucks for machine tools	2,472	684	14,005	11,998

Ruhr Settlement Is Anticipated

Large German Export Contracts Held Up Pending Adjustment of Threatened Labor Difficulty—Pacific Coast Merchants Buying Large Tonnages of Steel Bars in France—British Steel Association Continues Prices for November

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Oct. 30.—(*By Cable*)—The European iron and steel trade awaits the outcome of the Ruhr industry's threat to lock out 200,000 workers Nov. 1 if they persist in their repudiation of a wage agreement and demand more pay. Some interests anticipate a settlement at the last moment. In the meantime, large export contracts are being postponed by German producers in the belief a price advance will be certain to follow a strike or lockout. A report from Paris states there is a heavy demand for wire rods, and American merchants on the Pacific coast are buying large tonnages of steel bars. Certain producers of sheet bars and billets in Belgium have reappeared in the market.

The British Steel association has decided to leave prices of heavy products unchanged for November. Generally, there is a scarcity of specifications. Demand for shipbuilding and structural material is fairly well maintained. Builders of rolling stock benefit from colonial orders, but home railroads are out of the market. Pig iron stocks are low, prices are firm, but demand is not sufficient to warrant lighting additional furnaces. The Far East is taking good tonnages of tin plate, and inquiries are being received from South America. Orders for galvanized sheets for shipment to India are improving.

British Steelmakers Find Progress Is Delayed

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., Oct. 19.—In the Middlesbrough iron trade the trade revival is extremely slow and makers complain of undercutting by Midland firms. No. 3 is maintained at £3 6s ($16), whereas Derbyshire can be bought at £3 ($14.55), and it is not surprising that the Derbyshire makers are able to sell their iron in the Middlesbrough district. East coast hematite is in good demand at £3 10s ($16.97) and stocks have practically disappeared. In these circumstances it

Sterling $4.85

is expected that production will have to be increased if the present revival of demand continues.

The Midland position is decidedly patchy. In some cases consumers are more inclined to make contracts, while, on the other hand, a large merchant declares that his business has gone quiet again after a spurt during the last three weeks. Prices are certainly firmer for all grades of pig iron. The usual quotation is £2 16s for Northampton No. 3, but one maker with his furnace standing idle charges £2 18s ($14.05) for iron from stock. In the Barrow area business has improved a little in the hematite market, but makers are disappointed that the situation does not improve more substantially. Prices are unchanged on the week.

In the heavy branches of the steel trade the most disappointing is ship plates. The big works are equipped with powerful machinery and need a constant flow of orders to insure full employment. But the shipyards show no sign of revival, the tonnage

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, October 29	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$16.01	3 6 0*	$15.28	3 3 0	$15.28	3 3 0	$15.76	3 5 0
Basic	15.76	3 5 0	15.28	3 3 0	15.28	3 3 0	15.28	3 3 0
Basic-bessemer	16.98	3 10 0†	14.79	3 1 0	14.79	3 1 0	14.55	3 0 0
Hematite, Phosphorus 0.02-0.05	16.98	3 10 0	22.09	565*	.....	.....	16.98	3 10 0
SEMIFINISHED STEEL								
Billets	$30.31	6 5 0	$24.49	5 1 0	$24.49	5 1 0	$24.25	5 0 0
Wire rods	41.83	8 12 6	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$37.59	7 15 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.65c	7 12 6	1.35c	6 3 0	1.35c	6 3 0	1.38c	6 5 0
Structural shapes	1.60c	7 7 6	1.12c	5 2 0	1.12c	5 2 0	1.10c	5 0 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.40c	6 7 6	1.40c	6 7 6	1.42c	6 9 0
Sheets, black, 24 gage	2.17c	10 0 0	2.31c	10 10 0	2.31c	10 10 0	2.20c	10 0 0
Sheets, galvanized, 24 gage, corrugated	2.96c	13 12 6	3.01c	13 13 9	3.01c	13 13 9	2.94c	13 7 0
Bands and strips	2.22c	10 5 0	1.38c	6 5 0	1.38c	6 5 0	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.60c	7 5 0	1.60c	7 5 0	1.65c	7 10 0
Galvanized wire, base	2.93c	13 10 0	2.01c	9 2 6	2.01c	9 2 6	2.09c	9 10 0
Wire nails, base	2.38c	11 0 0	1.68c	7 12 6	1.68c	7 12 6	1.76c	8 0 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.01	3 6 0	$17.20	440(2)	$16.40	590	$18.58	78
Basic pig iron	15.76	3 5 0	18.57	475(1)	16.54	595	20.97	88
Furnace coke	5.15	0 13 0	5.87	150	5.14	185	5.12	21.50
Billets	30.92	6 7 6	22.09	565	27.38	985	28.83	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.68c	7 15 0	1.31c	730	1.44c	1,105	1.52c	141
Shapes	1.71c	7 17 6	1.22c	675	1.22c	940	1.49c	138
Plates, ship, bridge and tank	1.87c	8 12 6	1.54c	855	1.49c	1,145	1.71c	158
Sheets, black, 24 gage	2.28c	10 10 0	2.92c	1,620	2.47c	1,900	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.98c	13 15 0	3.50c	1,945	3.89c	2,975	3.78c	350
Plain wire	2.12c	9 15 0	1.94c	1,075	2.02c	1,550	2.48c	230
Bands and Strips	2.22c	10 5 0	1.46c	810	1.59c	1,225	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £21 14s 0d ($105.25) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

in fact is lower than in the first half of the year, and most of the steel work is on structural account. Bridge work continues to absorb good quantities. The Teesside firm of Head, Wrightson & Co. have recently been awarded an order for a new bridge over the Perak river, Malaya, involving 1500 tons of steel.

The galvanized sheet trade continues well employed with a widening demand from India, the West Indies and South America. India has been particularly disappointing this year and inquiry from that quarter is all the more welcome. Prices are firm at $13 10s ($65.46) to £13 15s ($66.67).

In tin plate output is falling and is now round 75 per cent of capacity, compared with 85 per cent for the first nine months. A meeting of tin plate makers was held at Swansea this week when it was decided to increase the restriction of output during the next quarter. Accordingly all the works will be obliged to shut down for three weeks during the three months commencing Nov. 3. Among developments this week is the taking over of the Glanrhyd Co. by Gilbertsons, tin plate manufacturers of Pontardawe. The Glanrhyd Co. has ten mills, six new and four of an older type, but only the new ones are working. Tin plate prices are unchanged at 18s ($4.37) to 18s 3d ($4.43) per base box and the volume of business has been light. Certain orders have come in from Australia, South America, the Far East and the Continent. Welsh steel bars are in better demand and makers are endeavoring to obtain a premium over the official minimum of £6 ($29.10) per ton. Heavy steel scrap for melting purposes is offered at £3 10s ($16.97) delivered South Wales.

British Steelmakers Hope for Import Duty

LONDON, Oct. 18.—(*European Staff Service*)—On several occasions leaders of the British iron and steel industries have approached the authorities, requesting that iron and steel should be protected by an import duty. The iron and steel manufacturers attempted, some time ago, to have their case brought before a court of inquiry in accordance with the safeguarding of industries act, but their application was refused. One of the conditions to be fulfilled for an industry to prove its case is that a duty, if it is conceded, will not have a detriment effect on other national industries. In the case of iron and steel, it is argued that a duty would react unfavorably on the working-up industries, on engineering and shipbuilding.

Recently a delegation of leading iron and steel mannufacturers approached the prime minister on the subject, but Mr. Baldwin said that he could take no steps for the present, because he was pledged not to open the door to protection. This brings up the political aspect of the case, as a large proportion of the population is in favor of a free-trade policy. When the present government came into power, it was on the distinct understanding that protection would not be brought into the country, and this was one of the principal planks of the conservative party at the elections of 1924. Iron and steel is considered a basic industry, and if it was granted a safeguarding duty it is generally felt that protection would follow.

Undoubtedly there will be no change in the present conditions until the next elections, in the spring of 1929. The statements made at the annual party conferences which recently have been taking place are of particular interest in relation to the position of the iron and steel industries. The liberals, as a party, are opposed to a protectionist policy. Ramsay McDonald, the labor leader, is against protection by tariff, but claims that sweated goods should be altogether debarred from entering the country. Stanley Baldwin, however, stated that all industries, including iron and steel, suffering from unequal foreign competition, would have an equal chance of putting forward their claims under the regulations of the safeguarding of industries act, and that the procedure of the act would be simplified.

This statement has led iron and steel manufacturers to hope that the country will endorse this promise at next year's election and that it will be possible for them to bring their case before a court of inquiry. It is possible that an investigation may then be made into conditions of the trade with a view to establishing whether a duty should be imposed. Such an inquiry would necessarily be thorough, and it can be anticipated that it will be a long time before an import duty is actually established on foreign iron and steel, if it be granted. Certain competent observers are, however, confident that eventually iron and steel will be protected.

German Steel Unions Find Conditions Better

BERLIN, Oct. 18.—(*European Staff Service*)—The German steelworks association has issued the reports of the various unions covering activities during September. The union of A-products, which handles semifinished steel, structural steel, and railroad track material, states that export demand for semifinished products has been active and prices have hardened. In structural steel domestic and export business have been satisfactory. Railroad track material did not constitute such a bright market, owing particularly to the policy of restriction of German railroads. The merchant bar union reports that business has developed and prices have increased. The hoop and band and the plate unions also report improving conditions.

The joint export committee of the raw steel union and of the A-products union has decided to increase the base prices for export of semifinished steel, and to reduce the export bounty granted to rerollers on orders for foreign markets. The raw steel union has decided to delay any increase in domestic prices, owing to unsatisfactory conditions prevailing in the domestic market for some time. However, in view of the increase in railroad transportation rates, it is probable that before long the price of raw steel will be increased. The hoop and band union, in view of the fact that domestic demand is decreasing, while foreign business is improving, has decided to raise the export quota of its members from 20 per cent to 22 per cent of their production.

The Mannesmann concern has obtained from its stockholders consent to increase the capital from 140,000,000 ($33,250,000) to 165,000,000 marks ($39,250,000). An increase in capital was made in 1927 to the extent of 33,000,000 marks ($7,825,000); of that amount 18,000,000 marks ($4,275,000) were expended to reimburse certain American and Swiss loans, and the balance was practically absorbed in covering the expense of the new plant at Huckingen. The increase is necessary to increase the working funds of the concern. The new Huckingen works have cost 38,000,000 marks ($9,000,000); the installation started in 1921, and it is expected that they will be ready to operate in November this year, and a considerable increase in pig iron production is expected. This plant, which comprises two blast furnaces of a daily capacity of 800 tons, was built with the object of rendering the concern independent in its supply of raw materials. The present raw steel capacity of the company is 500,000 tons per year. In addition to the blast furnace stacks, the new plant has four basic bessemer converters. The output of the new electrical works will be about 20,000 horsepower.

It is reported from Berlin that a provisional agreement has been drawn up between the steelworks' association of Germany and the Yugo-Slav government for furnishing the material necessary for the reconstruction of the Yugo-Slav railroad. The German steelworks are prepared to grant the Yugo-Slav government a loan of 100,000,000 marks ($23,815,000) at 7 per cent interest, which will be redeemable in ten years. It is understood this transaction will be financed by American banking interests.

It is reported from Warsaw that the Polish iron and steel makers have organized an export selling syndicate.

Refractories Institute and Ceramic Society May Consolidate

PROPOSED merging of the technical activities of the American Refractories institute and the American Ceramic society was given favorable consideration at the fall meeting of the American Refractories institute at the Hotel Vanderbilt, New York, Oct. 24. It was believed that the combining of these activities would overcome much of the present duplication of effort and would lead to the establishment of a more efficient technical bureau for refractories.

Under the proposed change the technical division of the institute and the refractories division of the Ceramic society would be known as the American Refractories institute division of the American Ceramic society. All technical papers of the institute, it was proposed, should be published in the Journal of the American Ceramic society, and the secretary of the institute serve as secretary of the American Refractories institute division of the American Ceramic society. It was further proposed that at least one of the technical sessions of institute division be held at the time and place of the annual meeting of the American Ceramic society.

The recent meeting, a one-day session, was devoted largely to a discussion of specifications and tests, with the primary object to bring about a closer understanding between consumers and manufacturers of refractories. An effort was made to reduce the discussion to as simple a form as possible, so that it could be more readily understood by nontechnical men.

Consumers Propose Tests

As a basis for discussion a table was used showing tests and specifications as prepared by consumers. Four specifications were presented, three applying to clay brick and one to silica brick. This latter was specified for use in coal-gas benches, generators, furnace arches and retorts. The first specification applied to clay brick to be used in boiler settings, oil stills and preheaters; the second to clay brick to be used for boiler settings only; and the third to be used for boilers and arches of shop furnaces.

The various tests discussed follow: Pyrometric cone equivalent; standard load test, 25 pounds at 2462 degrees Fahr.; spalling test at 2462 degrees Fahr. in 2 inches of water; cold crushing; and reheating at 2552 degrees Fahr. for 5 hours. Silica, titania, alumina, iron oxide, lime, magnesia and alkalies contents were discussed; also size requirements.

Distribution problems were touched on briefly, with President J. M. McKinley declaring that manufacturers were too prone to think in terms of thousands of brick and tons of clay. This, he said, was wrong; they should think more in terms of dollars. Sales effort was described by another speaker as wasted unless properly organized. Sales research was urged.

Advancement and shortcomings in the present-day use of specifications were outlined at the opening of the proceedings in a letter from G. Blatz, Seaboard Refractories Co., Perth Amboy, N. J. This was followed with a brief presentation of the history of refractories tests by J. S. McDowell, Harbison-Walker Refractories Co., Pittsburgh, who also expressed various interesting views on the use of specifications.

Material Control Emphasized

Particular emphasis was laid on the control of raw materials and finished products through the use of tests. It was agreed that tests are difficult to use in the writing of specifications and require considerable experience in applying them properly. However, it was stated that they are particularly valuable in the control of raw materials and the processes of manufacture. Consumers, it was declared, have pointed out the desirability of control tests, indicating uniformity of manufactured products. Belief was expressed that load test equipment should be standardized.

Various tests were explained by E. H. Van Schiek, Chicago Retort & Fire Brick Co., Chicago; C. E. Balyes, Ironton Fire Brick Co., Ironton, O., and S. M. Phelps, Mellon institute, Pittsburgh, with their remarks in many instances illustrated with lantern slides.

Mr. Phelps gave a brief summary of research work being conducted at Mellon institute. One development of particular interest, as described by Mr. Phelps, was a brickmeter. This machine was on demonstration and was designed to give the dimensions of brick in a way that would preclude all possibility of personal error. The speaker believed it should help greatly in the standardization of methods for obtaining the various sizes of bricks. At present, he declared measurements are made in a number of arbitrary ways which lead to considerable confusion.

He urged the installation of the brickmeter at various plants that the machine may undergo a thorough practical test, with the possibility of revisions in design later if necessary. The machine weighs 60 pounds, and operates on the parallel plane principle.

As deep interest was shown in the whole subject of tests and specifications by consumers and producers alike, meetings of this character probably will continue.

To Exhibit Refractories

Twenty per cent of the exhibition space has been sold and nearly half of the technical session programs have been arranged for the American Ceramic exposition which is to be held in the exhibition hall of Stevens hotel, Chicago, Feb. 4-9. This week will be known as American Ceramic Week; the exposition is being sponsored by the American Ceramic society and held in connection with the annual conventions of the American Ceramic society, the Common Brick Manufacturers' Association of America and other affiliated organizations. Several of the exhibits will be devoted to the display of refractory brick, its installation and methods of manufacture.

Subject to Double Tax

New York, Oct. 30.—The highest French court has ruled that American companies operating in France by means of subsidiary French companies are subject to twice the present French tax on profits, which is 18 per cent, states a copyrighted dispatch to the *New York Times*.

A manufacturers meeting will be held in connection with the fourth New England conference in Portland, Me., Nov. 15. Coincident with this will be the third annual "Maine In The Market Exposition". This will include 150 exhibitors, showing the leading industrial products of Maine.

Machinery

October Sales Probably Will Be the Best for Any Month This Year—Good Orders Are in Prospect for Balance of the Year

REPORTS from various important districts indicate that the October total of machine tool and shop equipment sales likely will be the best for any month this year. September was an exceptionally good month, but activity during the last four weeks was still better. The general situation suggests a continuation of interest for the balance of the year. A particularly encouraging feature is that the orders, although small, are coming from widely scattered sources. Politics apparently are cutting little figure. Wright Aeronautical Corp. is a large prospective buyer between now and Jan. 1. Automobile makers are buying well and parts manufacturers also take additional machinery in satisfactory number. Buying by railroads is unusually light.

New York, Oct. 30.—Machine tool sellers here generally are concluding a satisfactory month's business. One large interest reports that October sales will be the heaviest this year, and that trading here over the past three weeks or so has been comprised largely of small, scattered orders is regarded as significant. At the same time, the outlook continues promising. While fresh inquiry has slowed up a trifle over the past week or 10 days, considerable business is actively pending and some good lists are under contemplation for issuance within the few weeks. A large prospective buyer between now and the first of the year is the Wright Aeronautical Corp., Paterson, N. J. This interest, which was an especially active purchaser during the early weeks of the past summer, is scheduled to begin shortly on negotiations for a similar large amount of equipment. R. Hoe & Co., is expected to take action shortly on its list of five or six planers, but may not close on its lathe requirements for at least another month or so, as deliveries on this latter equipment are not so extended. The exact number of lathes to be purchased has not been definitely settled, although it appears that there will at least be ten. Pratt & Whitney booked 22 machines within the past week, including a 13 by 48-inch engine lathe and a 7 by 32-inch bench lathe for a railroad and three bench lathes for an industrial concern.

Worcester, Mass., Oct. 30.—With the exception of one or two industries, notably textiles, demand for machine tools holds steady with increases noted in spots. An automobile interest this week placed a list of tools with Rhode Island and Central Massachusetts manufacturers. A Worcester company also has booked a large Midwest contract for bar mill equipment, the bulk of the material to be made here. There is more interest from the metalworking industry. The bulk of new machinery for automotive interests appears to have been placed covering the recent spurt. The steadiness and increase in the production of automobiles has resulted in a long period of activity by several firms in this section. Demand has been less seasonable as formerly. Grinding machinery, going into a greater number of uses than ever before, is steady. Small tools are moving well. Jobbers' stocks of these are small. Electric motor production for machine operation indicates a continuance of this type of production machinery. Actual business placed this week shows little change from recent weeks, but there has been a better inquiry from a wider range of industries.

Pittsburgh, Oct. 30.—The general run of machinery business is steady although large jobs continue lacking. Most orders call for only a few tools. Inquiry is slightly more active, and pending work indicates a fairly active fourth quarter business. Crane inquiry is light.

Chicago, Oct. 30.—October is closing with the volume of machine tool business ahead of September, according to sales reports of most dealers in this territory. Several dealers estimate the October gain at as much as 15 per cent. Representing widely scattered sources, industrial orders for machine tools during the week were among the heaviest of the month in volume if not in value of equipment sold. Most of the orders were for single tools or lots of two or three items. Falk Corp., Milwaukee, closed on two horizontal boring mills in this district as a part of its $25,000 inquiry. Lathes and punch presses were active in the Chicago district. Lathe orders were for 18-inch and up. A metalworking concern in the Chicago district purchased three shapers. Combination punch and shear machines moved well, one dealer having sold three in the district and two west of here. A number of inquiries are expected from Milwaukee, Racine and Kenosha, Wis. Included in current inquiries is a request for bids on three shapers and a radial drill. Railroad inquiry is light. Chicago, Milwaukee, St. Paul & Pacific is asking for bids on two air compressors.

Cleveland, Oct. 30.—Activity in this district has been growing steadily during the past year and reached a high point in October. It is estimated that sales of equipment were at least 10 per cent better than in the preceding month. A most hopeful indication is that the majority of sales are small and are coming from well scattered sources. Automotive buying in this area as well as in Detroit is not particularly active, although practically all manufacturers are taking a little equipment. Tool manufacturers have well filled order books and with a steady stream of new business are finding it necessary to promise only deferred deliveries. Confidence in the outcome of the election has prevented any uncertainty as to the future of business.

CRANE ORDERS PLACED

Two special shovel cranes for tunnel work, reported placed by John F. Cogan Co., New York, with Harnischfeger Corp.

Among single orders were: 60-ton 3 motor crane for Phoenix Utility Co., New York, for installation in Arizona, to Cleveland Crane & Engineering Co.; 10-ton electric overhead crane for Youngstown Sheet & Tube Co., Youngstown, O., to Shaw Crane-Putnam Machine Co.; 25-ton locomotive crane of special type for Taylor-Wharton Iron & Steel Co., High Bridge, N. J., to Industrial Brownhoist Corp.; 25-ton locomotive crane for New York Central to Industrial Brown Hoist Corp.; 16-ton single-motor crane for Lockwood-Green Co., for Rome, Ga., to Box Crane & Hoist Corp.

Electrical Orders Reach New Record

Washington, Oct. 30.—New orders for electrical goods in the third quarter were the highest for any quarter since the department of commerce started its tabulation in 1923. Comparisons follow:

	1st quarter	2nd quarter	3rd quarter
1923	$225,399,383	$240,542,824	$201,910,099
1924	228,760,838	221,167,876	185,747,314
1925	233,023,182	227,502,652	232,933,532
1926	262,677,736	248,000,075	241,114,289
1927	243,651,415	236,427,121	235,557,807
1928	242,875,462	*244,467,209	264,419,328

	4th quarter	Total
1923	$218,165,415	$886,017,721
1924	231,470,552	867,146,580
1925	244,597,050	938,056,416
1926	260,078,082	1,011,870,182
1927	239,247,023	954,883,416
1928	242,875,462 *244,467,209	264,419,328

*Revised.

Bar Iron Wages Raised

Bar iron prices in September and October averaged 1.95c a pound, an advance from 1.90c in the preceding two months, according to S. C. Leonard, representing the Western Bar Iron association. This was determined at a meeting with representatives of the Amalgamated Association of Iron, Steel and Tin Workers. Bar iron mill wages will be advanced correspondingly for November and December. Puddlers will receive $11.55 a ton, compared with $11.30. Following is a comparison of sales prices on which wages have been based.

	1928	1927	1926	1925	1924
Jan.-Feb.	1.85c	1.95c	2.00c	2.00c	2.35c
Mar.-Apr.	1.85c	1.95c	2.05c	2.35c	2.35c
May-June	1.90c	1.95c	2.00c	2.05c	2.25c
July-Aug.	1.90c	1.95c	2.00c	1.95c	2.15c
Sept.-Oct.	1.95c	1.90c	2.00c	1.95c	2.10c
Nov.-Dec.	.....	1.85c	2.00c	1.95c	2.05c
Yearly av.	1.90c	1.90c	2.00c	1.99c	2.21c

CONSTRUCTION *and* ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

WATERBURY, CONN.—Bristol Co., manufacturer of temperature recording instruments, etc., plans the construction of a 1-story plant addition, 48 x 140 feet.

BOSTON—Department of public buildings will complete the power house and heating plant at St. Charles street jail.

BOSTON—Eldeen Mfg. Corp. has been incorporated with $1000 capital to manufacture machines and instruments for hosiery repairing, by Max M. Hoffman, 68 Mora street, Dorchester.

BOSTON—Creisse Corp. has been incorporated with 100 shares no par value to build power boats, erect and construct machinery, etc., by John J. Delany, 12 Warwick road, Brookline, Mass.

BOSTON—Universal Heaters Inc. has been incorporated with $50,000 capital to manufacture and deal in heaters and heating apparatus by Fred W. Goldthwaite, 19 Sherman road, Melrose, Mass.

BOSTON—Eastern Service Marine Co. has been incorporated with $50,000 capital to manufacture and deal in marine or other engines, marine hardware, etc., by Herman E. Smith, Kimball road, Lynn, Mass.

BOSTON—Burnham Incinerator Corp. of Massachusetts has been incorporated with $75,000 capital to manufacture and deal in incinerating machinery and appliances by Eugene F. Burnham, 575 Essex street, Lawrence, Mass.

BOSTON—Savage Aircraft Corp. has been incorporated with 1000 preferred shares and $5000 in common shares to manufacture airplanes and aircraft of all types by Robert B. Wetmore, 48 Athelstone road, Newton Center, Mass.

BOSTON—Dorchester Brass & Aluminum Foundry Inc. has been incorporated with 1000 shares no par value stock to manufacture all kinds of metal castings by Martin W. Riley, 1158 Hyde Park avenue, Hyde Park, Mass.

CHESTER, MASS.—Courtland Grinding Wheel Corp., Huntington road, has awarded the contract for a 2-story manufacturing plant to A. M. Cowles, 5 Crown street, Westfield, Mass.

FOXBORO, MASS.—Department of mental diseases plans to build a power plant addition at the state hospital.

SOMERVILLE, MASS.—Vacuum Co., 105 Mystic avenue, has awarded the general contract for a plant addition to J. W. Bishop Co., 100 Erie street, Cambridge.

SPRINGFIELD, MASS.—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., plans the construction of an addition to its laboratory here.

CAMDEN, N. J.—Derrick Digger Co. has been incorporated with 2000 shares no par value stock to manufacture tools, etc., by Edmund H. Reeves, Camden, attorney.

KEARNY, N. J.—West Hudson Foundry & Pattern Co. Inc. has been incorporated with $50,000 capital by Anthony A. Calandra, Newark, attorney.

WEST NEW YORK, N. J.—Ideal Laundry Co., Palisade avenue, soon will award the contract for a boiler house and power plant.

BROOKLYN, N. Y.—Meditz & Brandes Iron Works has been incorporated with $20,000 capital by S. J. Robbins, 51 Chambers street, Manhattan, attorney.

BROOKLYN, N. Y.—Automatic Liquid Valve Corp. has been incorporated with $250,000 capital by D. J. Marks, 1545 Broadway, Manhattan, attorney.

BUFFALO—Stewart Motor Corp., 93 Dewey, T. R. Lippard, president, has awarded the general contract for a 1-story manufacturing plant to Crooker & Carpenter, Crosby building.

BUFFALO—Wire Wheel Corp. has purchased a building adjacent to its plant here and will increase its production of automobile wheels approximately 50 per cent after installation of new machinery and equipment.

EAST BUFFALO, N. Y.—New York Central railroad, 466 Lexington avenue, New York, plans the construction of car repair shops here. F. B. Freeman is chief engineer.

JAMESTOWN, N. Y.—New generator and boiler equipment will be purchased next month by the municipal lighting plant here.

NEW YORK—Atlas Steel Shelving Corp. has been incorporated with $20,000 capital by Tally & Gordon, 347 Fifth avenue, attorneys.

NEW YORK—Fleisher Metal Refining Works has been incorporated with 200 shares no par value stock by M. Kleitman, 54 Nassau street, attorney.

NEW YORK—New York Ship Building Co. has been incorporated with 100 shares no par value by E. S. Corporation Co., 150 Broadway.

NEW YORK—Galfac Mfg. Co. has been incorporated with $30,000 capital to manufacture signal devices by A. P. Wilkes, 63 Park Row, attorney.

RICHMOND, N. Y.—Stapleton Iron Works has been incorporated with $25,000 capital by C. E. Smith, St. George, attorney.

EASTON, PA.—Quality Alloy Casting Co. has been incorporated with $10,000 capital to manufacture and deal in castings, machinery and parts by J. Clem Kline, R. F. D. No. 3, Easton.

PHILADELPHIA—J. L. Langsdorf has awarded the general contract for a machine

Resale Equipment News

W. F. ROBERTSON, Springfield, O., has bought the plant and business of the Pittsburgh Tin Plate & Steel Corp., Marietta, O., at receivers' sale, subject to approval of the court. The plant is to be made a subsidiary of the Hudson Steel & Tin Plate Co., Marietta, which is also owned by Mr. Robertson, who is head of the W. F. Robertson Steel & Iron Co., Springfield. This purchase increases steelmaking facilities of the Robertson interests at Marietta about 40 per cent.

* * *

Equipment of the Royal Steel Co., 5300 West Sixty-sixth street, Chicago, sold at auction by Michael Tauber & Co., auctioneers, included the entire equipment of the plant, which was engaged in the manufacture of steel products. Among buyers of the equipment were Passman Bros., Donahue Steel Co., Midland Equipment Co., Scott Steel Co., Scully Jones Co., Louis E. Emmerman and Danly Machine Specialties, all of Chicago.

* * *

Real estate, office furniture and supplies of the Eagan Johnson Steel & Iron Co., Eddystone, Pa., will be sold Nov. 14 by the receivers in equity. The site contains 17 acres, with a foundry building and office building. The equipment includes a foundry with two cupolas, a fully equipped machine shop and pattern shop, power plant with compressors, generators and blowers. Samuel T. Freeman & Co., Philadelphia, are the auctioneers.

Sales Calendar

Nov. 2—Sale by sealed bids of navy surplus at Fore River plant, Bethlehem Shipbuilding Corp. Ltd., Quincy, Mass.

Nov. 14.—Receivers' sale in equity of real estate, equipment and supplies of Eagan Johnson Steel & Iron Co., Eddystone, Pa.

Nov. 15—Bollinger-Andrews Construction Co. property for sale on premises, Verona, Pa.

shop on Fifteenth street to Lam Building Co.

PHILADELPHIA—American Pressed Steel Co. has been incorporated with $5000 capital to manufacture and deal in iron and steel products by J. R. Bailey, Bryn Mawr, Pa.

PHILADELPHIA—Philip C. Hilley Co. has been incorporated with $25,000 capital to manufacture and deal in sheet metal specialties, bakers' machines, equipment, etc., by Philip W. Moniger, 1745 North Redfield street.

PHILADELPHIA—Quaker Metal Products Co. has been incorporated with $20,000 capital to manufacture and deal in metal devices by Louis Levy, 5941 Pine street, Philadelphia, treasurer.

PHILADELPHIA—William Costello Co. Inc. has been incorporated with 100 shares no par value stock to manufacture and deal in machinery by William Costello, 4629 North Thirteenth street, Philadelphia.

PHILADELPHIA—Electro Mfg. Co. of America has been incorporated with 90 shares no par value stock to manufacture and deal in electric fans, toasters, etc., by Louis P. Weiss, 5833 Larchwood avenue, Philadelphia.

PITTSBURGH—Pittsburgh Foundry & Machine Co., Thirty-sixth street, William A. Smith president, plans the construction of a foundry building.

EAST PROVIDENCE, R. I.—Abrasive Machine Tool Co., Dexter road, has awarded the general contract for a 1-story machine shop, 60 x 150 feet, to Hunes Construction Co., Central Falls, R. I.

ST. JOHNSBURY, VT.—American Fork & Hoe Co. has awarded the contract for a 1 and 2-story manufacturing and power plant to J. M. Swan & Sons, 144 Portland street. (Noted Oct. 25.)

East Central

CHICAGO—Caspers Tin Plate Co. will occupy the building, 1-story, to be built at 3414 West Forty-eighth place by the Central Mfg. District.

CHICAGO—Northern Car Equipment Co., 80 East Jackson boulevard, has been incorporated with $5000 capital to manufacture and deal in railroad appliances by May J. Nenneman, James Dunbar and R. W. Burnett.

CHICAGO—General Engineering Works, 340 West Huron street, C. A. Knuepfer, manager, plans the construction of a 1-story plant. Weiss & Neistadt, 53 West Jackson boulevard, are architects.

EAST ST. LOUIS, ILL.—Parks Airlines Inc., Missouri theater building, St. Louis, has awarded the contract for structural steel for its 1-story airplane manufacturing plant, 100 x 560 feet, to St. Louis Structural Steel Co.

ROCK ISLAND, ILL.—International Harvester Co. has awarded the structural steel contract for a plant addition to Gage Structural Steel Co. The contract for structural shapes for a foundry building has been let to McClintic-Marshall Co.

CRAWFORDSVILLE, IND.—Mid-States Steel & Wire Co. has awarded the general contract for a 1-story foundry, 85 x 245 feet, to Warner & Wirt, Crawfordsville.

GREENSBURG, IND.—Greensburg Chamber of commerce contemplates the construction of an airport. The architect is not selected as yet.

HOBART, IND.—City plans the construction of a water and light plant. Burns & McDonnell Engineering Co., 401 Institute building, Kansas City, Mo., is the engineer for the project.

INDIANAPOLIS—R. McGregor has awarded the contract for a machine shop and garage, 70 x 200 feet, to A. V. Stackhouse, 2611 Cornell avenue.

SOUTH BEND, IND.—Studebaker Corp. plans the construction of a new unit to house its engineering department offices and increase the research laboratory facilities.

DETROIT—Ajax Bolt & Screw Co.'s plant was damaged by a fire Oct. 22.

DETROIT—Holcroft & Co., 6545 Epworth boulevard, plans the construction of a 1 and 2-story plant, 105 x 180 feet, for the manufacture of foundry equipment.

DETROIT—Michigan Steel Tube Products Co., manufacturer of steel tubing, plans plant improvements, including additions to the manufacturing equipment, manufacturing building, steel storage building, etc.

DETROIT—Efficiency Tool & Mfg. Co., 443 East Canfield avenue, has been incorporated with $6000 capital to manufacture jigs, fixtures dies, etc., by Alfred Geffen, Albert Broner and Henry S. Becker.

DETROIT—Victory Machine & Tool Co., 5259 Western avenue has been incorporated with $50,000 capital to manufacture and deal in machine products, tools, dies, etc., by William J. Ziegler, Max P. Diedrich and George R. Harrison.

DETROIT—Huma-Phon, 9515 Gratiot avenue, has been incorporated with $1000 capital to manufacture and lease voice reproducing machines by James N. Robertson, Roy J. Johnson and Hazel M. Deneau.

DETROIT—Tool-Engineering Co., 6482 Epworth boulevard, has been incorporated with $10,000 capital to manufacture and deal in tools, dies, patterns, etc., by Anthony J. William, Thomas E. Pouttu and Charles B. Findley.

DETROIT—Multi-Gyro Engine Co., 1208 Lafayette building, has been incorporated with $1000 capital to manufacture multi-gyro engines by Eric W. Chamberlain, Francis Gurney and William R. Bradford.

FLINT, MICH.—Crane Co., 836 South Michigan avenue, Chicago, is inquiring for monorail carrier system, crane, etc., for its proposed 1-story pipe warehouse, 105 x 105 feet.

HOWELL, MICH.—Erb-Joyce Foundry Co., with plants here and at Vassar, plans the construction of a new building at Vassar.

JACKSON, MICH.—Frost Gear & Forge Co., E. J. Frost, president, South Horton and Tisen streets, has awarded the general contract for a 1-story plant addition to North-Moller Co., 120 Cortland street, Jackson.

LANSING, MICH.—Motor Wheel Corp., Saginaw street, H. S. Harper president and general manager, has awarded the general contract for a 1-story manufacturing plant to H. G. Christman Co., Porter Apartment building. (Noted Oct. 25.)

L'ANSE, MICH.—Wisconsin-Michigan Power Co., subsidiary of North American Co., is having surveys made on Sturgeon river for construction of a power project including dams and power lines. S. B. Way is president. E. C. Richter and Edward Schmeidman, Milwaukee, are the engineers.

PLYMOUTH, MICH.—Detroit Ring Casting Co., suffered damage to its spark plug manufacturing plant Oct. 12 in a fire.

SAGINAW, MICH.—Wilcox Products division of Wilcox-Rich Corp., manufacturer of auto parts, is inquiring for general machine shop equipment for its proposed 1-story plant, 30 x 270 feet.

ST. JOSEPH, MICH.—Upton Machine Co., Edgewater street, L. C. Upton president, plans the construction of a 1-story plant addition.

CANTON, O.—Timken Roller Bearing Co. plans a second building expansion program with work to start immediately on an addition to the roller bearing plant to increase production for the automobile industry.

CINCINNATI—Philip Carey Mfg. Co., manufacturer of high pressure steam pipe insulation, etc., plans the construction of a boiler and power plant at the Lockland, O., works.

CLEVELAND—American Brass Mfg. Co. has been incorporated with 2000 shares no par value stock by Joseph Arth Jr., 1234 Chase avenue, L. J. Kane and A. S. Brien.

COLUMBUS, O.—Weinman Pump Mfg. Co., 276 Spruce street, has awarded the general contract for the construction of a 2-story plant to Middle States Construction Co., 1181 Essex avenue.

COLUMBUS, O.—The east wing of the Columbus Buggy Co. has been purchased by three companies, Buckeye Blower Co., Iron Products Co. and the Columbus Heating & Ventilating Co. An addition will be erected and the companies expect to move into their new location Jan. 1.

LIMA, O.—Superior Body Co. has awarded the contract for a 1-story manufacturing plant addition to H. Tuttle, 350 South Woodlawn avenue.

ORRVILLE, O.—Will-Burt Co. is equipping a plant here where it will carry on the manufacture of an automatic coal burner for domestic use.

ORRVILLE, O.—K. & F. Brass Foundry, manufacturer of brass and white metal products, has been purchased by H. E. Jenet and M. R. Jenet. Plans are being considered for a new plant.

ASHLAND, WIS.—Minneapolis, St. Paul & Sault Ste. Marie railroad, First National-Soo Line building, Minneapolis, and the Northern Pacific railroad, Railroad building, St. Paul, are jointly building a 5-stall roundhouse, water tank, warehouse and machine shop.

BELOIT, WIS.—Lakeside Railway Signal Co., 732 South Hancock street, Freeport, Ill., contemplates the construction of a 1-story plant and warehouse at Hardner street and Park avenue.

EAU CLAIRE, WIS.—Northwestern Steel & Iron Co. has let general contract to Walker Bros. for a 1-story warehouse, 48 x 100 feet, at Ball, a suburb of Eau Claire. (Noted Oct. 11.)

LA CROSSE, WIS.—National Gauge & Equipment Co., P. M. Gelatt president, has let general contract to F. R. Schwalbe & Sons for an addition to plant 130 x 160 feet, at Caledonia and Gillette street. (Noted Oct. 11.)

MUSCODA, WIS.—Muscoda Mfg. Co., furniture manufacturer, has started work on improving its plant, including a new power house.

West Central

STEVENS POINT, WIS.—Minneapolis, St. Paul & Sault Ste. Marie railroad, First National-Soo Line building, Minneapolis, has started work with company forces on a roundhouse addition, 12 x 120 feet. A. E. Wallace is vice president and general manager.

CEDAR FALLS, IOWA—Banner Brass Foundry Co., C. W. Olsen manager, 1807 Washington street, will build a 1-story brass foundry, 40 x 100 feet.

DAVENPORT, IOWA—Blackhawk Foundry & Machine Co., W. K. Voss president, 323 Clark street, will build a 1-story foundry addition.

DAVENPORT, IOWA—Davenport Machine & Foundry Co., 1628 West Fourth street, manufacturer of machinery and fabricator of structural steel, is building an addition.

SIOUX CITY, IOWA—Albertson & Co., manufacturers of automotive tools, have awarded the contract for a 4-story plant addition, 40 x 150 feet. (Noted Oct. 18).

HOPKINS, MINN.—Minneapolis Threshing Machine Co. has let general contract to C. F. Haglin & Sons Co., 920 National building, Minneapolis, for a 1-story foundry and addition to a factory to be built here.

MINNEAPOLIS—Despatch Oven Co., manufacturer of ovens for all purposes, plans the construction of a new plant to increase its manufacturing capacity.

MINNEAPOLIS—Star Ornamental Iron Co. has been incorporated with $50,000 capital. Erick Green, 3549 Pleasant avenue South, is one of the incorporators.

MINNEAPOLIS—Chicago, Milwaukee, St. Paul & Pacific railroad has let the general contract to W. M. Murphy & Son, 1608 Pioneer building, St. Paul, for construction of 10 engine pits and an addition to shop building.

MINNEAPOLIS—Wm. S. Dwinell, 1217 Plymouth building, has let the general contract to Arnold Construction Co., 510 Guardian Life building, St. Paul, for a 1-story plant, 40 x 160 feet, at Twenty-fourth street and Hiawatha avenue. The plant will be leased by the Carleton Screw Products Co., 121 Twenty-seventh avenue southeast. (Noted Oct. 25.)

ROCHESTER, MINN.—Bids are being received by A. J. Lentfer, secretary of the utility board, for construction of a 1-story electric light plant addition to house a new boiler.

WINONA, MINN.—Real-Oil-Heat Burner Co. has been incorporated with $50,000 capital by H. S. Youmans and J. B. Leveille, to manufacture oil burning heaters, etc.

INDEPENDENCE, MO.—Gleaner Combine Harvester Corp., Cottage and Hayward streets, plans plant expansion. The company manufactures combine machines to cut and thresh grain, and feed mills.

ST. LOUIS—Curtis Mfg. Co., Keinlen avenue, manufacturer of pneumatic machinery, etc., plans plant expansion and is arranging for a sale of stock.

ST. LOUIS—Board of public service will receive bids until Nov. 20 for 10-ton electric box, girder crane and hoist for fire department repair shops in municipal service building.

ST. LOUIS—Bendster Burner & Mfg. Co. has been formed as division of Urbauer-Atwood Co. for manufacture and distribution of oil and gas burners. H. F. Urbauer, president Urbauer-Atwood Co. and Midwest Piping & Supply Co., is also president of Bendster Burner & Mfg. Co.

Southern States

BIRMINGHAM, ALA.—Stockham Pipe & Fitting Co. has awarded the contract for the construction of a warehouse and shipping building and a laboratory to the H. K. Ferguson Co., Cleveland. Construction is planned to be completed by Jan. 1. The laboratory will be 1-story, 60 x 25 feet, while the warehouse will be 2-story, 104 x 251 feet, to include freight and barrel elevators and a train shed.

LEEDS, ALA.—Kelley Stove & Range Co. has been incorporated with $25,000 capital by R. J. Kelley and will construct a plant, 160 x 360 feet, for the manufacture of stoves and ranges.

ST. PETERSBURG, FLA.—City commissioners have approved plans for the airport which is to be located on south waterfront. It will be known as Albert Whitted airport.

ATLANTA, GA.—Fire damaged the plant of the Atlanta Plow Co. here recently.

ROME, GA.—Griffin Foundry & Mfg. Co. was damaged by fire Oct. 10. Plans for rebuilding the plant have been started already and work is expected to be under way soon.

HENDERSON, KY.—Tipple and boiler house at Smith-Mills coal mines were damaged in a recent fire.

NEW ORLEANS—Crescent Engineering Co., 522 Poydras street, Fred S. Renauld president, has been incorporated with $100,000 capital to manufacture marine auxiliaries.

OAKDALE, LA.—Louisiana Public Utilities Co., 600 North Second street, Harrisburg, Pa., plans to rebuild its power plant and install internal combustion engines for power for Oberlin and Kinder, La.

CHARLESTON, S. C.—Chamber of commerce is interested in establishing an airport here.

DALLAS, TEX.—Dallas Power & Light Co. plans enlargement of generating capacity at its North Dallas station, including new turbo-generating unit of approximately 25,000 kilowatt capacity, new boiler room, pump house, smokestacks, etc.

GRAHAM, TEX.—M. K. Graham has donated a site for an airport which will be constructed here.

HOUSTON, TEX.—Wackman Welded Ware Co. of Texas has awarded the contract for a 1-story plant, 92 x 201 feet, to Forrest W. McNeir, 2603 Chartres street.

HOUSTON, TEX.—Fire damaged the 2-story building occupied by the Texas Machine Tool & Die Works and Duecker Bros. Belting Co.

LAGUNA VISTA, TEX.—Dixie Development Co., A. R. Jones, 900 Land Bank building, Kansas City, Mo., president, plans to build three pumping plants in connection with an irrigation project.

Western States

EUREKA, CALIF. — Highway commission, Sacramento, plans to build maintenance shops here.

SANTA MARIA, CALIF.—Santa Maria Airlines Inc. plans to build two new hangars and a machine shop, 1-story.

GREAT FALLS, MONT.—International Harvester Co., 606 South Michigan avenue, Chicago, is taking bids for construction of a 3-story branch plant, 127 x 335 feet. W. D. Price is superintendent of construction.

SEATTLE—Majestic Furnace & Mfg. Co., 1723 Westlake avenue north, contemplates construction of a new unit, 1-story, 95 x 290 feet, on newly acquired property.

SEATTLE—Puget Sound Power & Light Co., Stuart building, has awarded the contract for a steam power plant to be built on Lake Washington to Stone & Webster Inc., Stuart building.

Canada

HAMILTON, ONT.—Galloway Engineering Co. Ltd. has been incorporated with capital stock of 1000 shares no par value by Collin W. G. Gibson, Robert F. Inch and Henry E. B. Coyne.

MILTON, ONT.—E. Durno Ltd. has been incorporated to manufacture and deal in builders materials and to carry on the business of con-

tractor, with $40,000 capital by David Goldstick, Henry Papernick and Joseph B. Solway.

TORONTO, ONT.—Jiffy Link Co. Ltd. has been incorporated to manufacture and deal in motor equipment and accessories with $40,000 capital by Jacob M. Wainburg, James George G. Bagley and Gladys Russell.

TORONTO, ONT.—Canadian General Electric Co. has received a large order for electric equipment for the hydroelectric plant now being erected at Island Falls, Sask., by the Hudson Bay Mining & Smelting Co.

WESTON, ONT.—Cruickshank Ltd. has been incorporated to manufacture motor cars, motor wagons and airplanes, with 50,000 shares no par value stock by Wallace J. Cruickshank, Frederick D. Cruickshank and Charles E. Tilson.

GRAND MERE, QUE.—Fairchild Aviation Co. of Canada, plans the erection of a plant here for the manufacture of airplanes. It is planned to begin operations in May.

MONTREAL, QUE.—Church Ross Co. Ltd., 698 St. Catharine street west, has let subtrades in connection with addition to the plant of the American Can Co., 2065 Jeanne d'Arc street.

MONTREAL, QUE.—Aluminum Ltd. has been incorporated to manufacture and deal in aluminum products, with $25,000 capital by William R. West, Salter A. Hayden and William C. Terry.

MONTREAL, QUE.—Holman Machines Ltd. has been incorporated to manufacture and deal in gas and electric fittings, electric wiring, brass founding, etc., with $100,000 capital by William G. Thompson, William Bayliss and Archibald S. Wilson.

MONTREAL, QUE.—National Electric Corp. of Canada Ltd. has been incorporated to manufacture and deal in automotive equipment, supplies and accessories, and electrical supplies and apparatus, with $50,000 capital by Adrian Knatchbull-Hugesson, William F. Macklaier and Hamilton L. Smith.

MONTREAL, QUE.—Concrete Steel Fabricating Co. Ltd. has been incorporated to take over the steel bending and equipment of Dominion Reinforcing Steel Co. Ltd. of Montreal, and to manufacture and deal in steel products with $50,000 capital by William H. G. Flay, Stanley G. Metcalfe and William M. Unger.

MONTREAL, QUE.—S. & H. Engineering Co. Ltd. has been incorporated to carry on the business of heating, mechanical engineers, and manufacture of oil burning engines and other machinery with $100,000 capital and 1000 shares no par value stock by John A. Mann, Cecil G. MacKimmon and Gilbert T. LaFleur.

MONTREAL, QUE.—John Quinlan & Co., 1165 Greene avenue, have been awarded general contract for the erection of a power house for the Montreal general hospital. Structural steel contract has been awarded to the Dominion Bridge Co., Lachine, Que. Building to be 64 x 64 feet, structural steel and reinforced concrete construction. J. Cecil McDougall, 85 Osborne avenue, is architect for the project.

ST. JOHNS, QUE.—Russell Mfg. Co. of Middleton, Conn., will erect a branch plant for the manufacturing of brake linings for automobiles.

VILLE EMARD, QUE.—Walter G. Hunt & Co. Ltd., 1405 Bishop street, has been awarded general contract for the erection of an addition to the forge foundry here for the Canadian Tube & Steel Products Ltd., 107 Hamilton street. Building to be 1-story, 30 x 100 feet. Equipment not yet purchased.

MELVILLE, SASK.—Underwood & McLelland, engineers, Saskatoon, Sask., have submitted plans for sewage and waterworks plants to be constructed here. Construction work on waterworks plant will be started soon but sewage plant will not be started until next year.

REGINA, SASK.—General Motors Corp. of Canada Ltd., Oshawa, Ont., in connection with the assembly plant under construction here has awarded additional contract to Smith Bros. & Wilson Ltd., Eighth and Ottawa streets, for the erection of a power house, garage and testing track.

REGINA, SASK.—W. E. Phillips Co. Ltd., head office, Oshawa, Ont., has let general contract to the Pool Construction Co. Ltd., Hamilton and Eighth avenues, for the erection of a glass plant and power house here. Architects, Hutton & Souter, 6 James street, Hamilton, Ont. Building to be 1-story, 105 x 185 feet, reinforced concrete and brick construction.

New Trade Publications

BEARING METALS—Invincible Bearing Metals Corp., Sandusky, O., has issued a folder describing its products. Two photomicrographs illustrate the publication.

CRANE MOTORS—General Electric Co., Schenectady, N. Y., has issued a bulletin on one type of its crane and hoist motors, illustrated to show details of construction.

CUTTING TOOLS—Carboloy Co. Inc., New York, sets forth in a booklet the claims of its material for metal cutting tools. A description of the material and halftones showing its action in cutting metal make up the text.

CHUCKS—City Machine & Tool Works, Dayton, O., features in a current bulletin its gear-grinding chuck. It is designed to hold gears for internal grinding, leads from the front without the necessity for adapters and possesses other advantages. Illustrations show it in operation.

KELVIN BRIDGE—Leeds & Northrup Co., Philadelphia, has issued a bulletin on the Kelvin bridge it manufactures for the use of students. It is illustrated and contains an explanation of its use.

MONORAIL SYSTEMS—Reading Chain & Block Corp., Reading, Pa., has issued a catalog of its monorail conveying systems. Details of its construction are shown, and leading features are illustrated. Engineering data cover design, strength and other details.

SPEED REDUCERS—Speed reducers manufactured by the D. O. James Mfg. Co., Chicago, are presented in a current catalog. These are of all styles and designed for all application of such equipment. It is well illustrated.

STANDARD STEEL BUILDINGS—Blaw-Knox Co., Pittsburgh, has prepared a booklet describing advantages of its line of standard buildings of copper-bearing galvanized steel for industrial purposes. It is illustrated by views of various types, with floor plans and details of architecture.

THREADING HEADS—A catalog by the Landis Machine Co., Waynesboro, Pa., shows its line of threading heads and taps. It contains illustrations of various pieces of equipment under these classifications, with specifications and descriptions.

TURRET LATHES—Jones & Lamson Machine Co., Springfield, Vt., is distributing a rotogravure bulletin, containing full page pictures of successive operations on its flat turret lathe for bar work. Time necessary for each operation and the total for the piece are given.

VALVES AND PIPE—Duriron Co. Inc., Dayton, O., in a current bulletin, features its plunger release plug valve, constructed of its special metal to resist action of acids and corrosive liquids. Other valves are also shown.

MOLDING MACHINES—Osborn Mfg. Co., 5401 Hamilton avenue, Cleveland, has issued a folder describing and illustrating two of its molding machines. The folder contains several illustrations, two of which point out in detail the advantages of the devices and a layout showing a method of using them to the best advantage.

STEEL FRAMING FOR DWELLINGS—Steel Frame House Co., Pittsburgh, has issued a booklet setting forth the argument for using structural steel frames for dwellings, in the interest of strength, durability, fireproofness and other characteristics. Views, floor plans and elevations for dwellings of various types are presented.

PUMPS—Equipment for buildings, as provided by the Worthington Pump & Machinery Corp., New York, is shown in a current catalog. It covers exhaust heating equipment, pumps for heating systems, vacuum pumps, wells, sump and house pumps, for swimming pools, elevators and lifts, water meters, refrigerating equipment and compressed air equipment. It is illustrated.

RECORDING INSTRUMENTS—A catalog by the Bristol Co., Waterbury, Conn., covers its line of recording instruments for use at a distance from the point at which observations are taken. It is illustrated to show construction and operation of the various types of recorders, for showing pressure, temperature, liquid level, mechanical motion and other facts. Sample charts are shown, adapted to various uses.

SPEED REDUCERS—Farrel-Birmingham Co. Inc., Buffalo, has published a catalog of its roller bearing type of speed reducers from the smallest to the largest. It is fully illustrated, showing types of double helical gears, process of their manufacture and completed speed reducers. Drawings and tables of mechanical data supplement the text. Views of installations in various branches of industry are shown.

ARC WELDING—Lincoln Electric Co., Cleveland, has published a booklet to supplement its former publication on the new age in iron and steel. This booklet tells how to begin the application of arc welding in production manufacturing. Most of the text is devoted to the redesign of machinery. In developing the theory of arc welded design many line drawings have been used to show how standard steel shapes are utilized to build up structures formerly cast. The booklet indicates progress in the substitution of welded steel for cast iron.

BUCKET ELEVATORS—Jeffrey Mfg. Co., Columbus, O., has issued a 72-page catalog of its bucket elevators. The booklet contains illustrations and drawings of the elevators, both assembled and in detail. It also contains many photographs of typical installations and several types are illustrated with phantom views. Tables give sizes, capacities, weights and prices. Part of the catalog is devoted to the casings, motor platforms, ladders, gear guards, buckets, etc., which this company makes. These are accompanied by tables of information required about these accessories.

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INDIANAPOLIS, IND.—
1412 Merchants Bank Bldg.

CLEVELAND, OHIO—2002 Union Trust Bldg.
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Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLING

Butt Weld

¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts. Less carloads 4 points less

STEEL (Lap Weld)

2 and 2¼-inch	27 off
2½ and 2¾-inch	37 off
3-inch	40 off
3¼ to 3¾-inch	42½ off
4 to 4½-inch	46 off
5 to 6-inch	40 off

(Note—Additional discounts of seven extra 5 per cents now being given on 21,000 pounds or more.)

CHARCOAL IRON

1½-inch	+18
1¾-inch	+ 8
2 and 2¼-inch	2 off
2½ to 3-inch	7 off
3¼ to 4½-inch	9 off

(Note—Additional discounts of two 10's and one 2½ now being given on 12,000 pounds or more.)

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48-off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	45 off

SEAMLESS HOT ROLLED

2 and 2½-inch	40 off
2½ and 2¾-inch	48 off
3-inch	52 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
21-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5¾-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922 or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot	.20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot	.20c
Plates ordered 7.65 pounds per square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates	1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c